NORTHEAST MARKETING ISSUE
Pages 9-16

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NPFI Offers to Aid Railroads in Reducing Costs

Industry Traffic Committee Wants to Help Solve Problems

— See Photo on Page 21 —

WASHINGTON—The National Plant Food Institute has announced that, in the interest of avoiding further rail freight rate increases, it is offering "such assistance as it appropriately may give before regulatory commissions or otherwise, in helping the railroads to reduce unit operating costs."

This action is the result of a resolution passed by the Institute's Traffic Committee during its recent meeting in Carlsbad, N.M. The committee also commended the southern carriers "for their realistic forbearance" in the application of rate increases permitted by the Interstate Commerce Commission under Ex Parte 206, and urged railroad managements in other territories to follow the lead of the southern carriers by applying the rate increases "on a realistic basis."

In passing the resolution, the group took recognition of the problems of increasing costs faced by the railroads, but deplored the effect of increasing freight rates in diverting fertilizer tonnage from the railroads to competing forms of transportation including private carriers.

The resolution offers to help the railroads achieve reduced unit operat-

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Control Officials Hear Plea for Uniform Figures on Use by Materials, Grades

By GEORGE W. POTTS
Croplife Staff

WASHINGTON—A request for consumption figures by materials and grades on a more uniform basis from all states, at least semi-annually, and preferably quarterly, as an invaluable assist to the fertilizer industry in improving production, merchandising and distribution of products was voiced by Paul T. Truitt, executive vice president of the National Plant Food Institute here Oct. 18. The appeal came in an address presented at the 11th annual convention at the Association of American Fertilizer Control Officials.

In a forceful address, Mr. Truitt pointed out that the NPFI has stressed the need for these compilations by states and counties for some time, and indicated that it would be appreciative of activity on the part of the official organization for active assistance in securing state fertilizer consumption statistics. "The improvement in current fertilizer statistics is one of the important immediate steps on which we seek your cooperation," he stated.

"The industry needs are considerable," Mr. Truitt said, pointing out that "they arise from various sources. None are easily controlled and, for our own well-being, all need to be appropriately satisfied. In these needs lie our opportunities to help make farming more efficient, more profitable and to put our industry in better order."

Summing up the current situation as it will reflect in future business, he noted fast population growth with the increased numbers well employed, and income in dollars high. Touching on the threat of inflation he said "inflation has a positive effect on the cost of fertilizers. It raises costs and makes selling harder. It is an obstacle to our goal of 'doing a better job.'" He urged his audience to "give it most careful thought and attention."

Touching on the probable agricultural picture of tomorrow, he noted that "there is evidence at hand that the farm program as we have known it for the past quarter-century may soon be reshaped... There are some indications that soon Congress may revise the farm program so that efficient farmers will prosper at prices made

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Pesticide Officials Discuss Definitions and State Laws

By JAMES W. MILLER
Croplife Staff

WASHINGTON, D.C.—Three new pesticide terms reached the "tentative definition" status by action of the Association of American Pesticide Control Officials at their 11th annual convention at the Shoreham Hotel here Oct. 18-19. Tentative definitions for (1) pesticides, (2) defoliants, and (3) nematocides, were approved and will be up for final adoption at the 1958 convention.

The pesticide control officials heard progress reports on all phases of activity affecting state and national pesticide control procedures, and listened to several formal discussions on such topics as nematocides in plant pest control, bioassay of fungicides and the need for maintaining uniformity in precautionary labeling.

Definitions given tentative status by the AAPCO include:

(1) Pesticide—"Any substance or mixture of substances intended for preventing, destroying, repelling, or mitigating any insects, rodents, fungi, bacteria, weeds or other forms of plant or animal life or viruses, except viruses on or in living man or other animals."

(2) Defoliant—"Any substance or mixture of substances intended for killing or artificially accelerating the drying of plant parts, with or without causing abscission."

(3) Nematocide — "Any substance or substances intended for preventing, destroying, repelling, or mitigating nematodes, other worms, or any other invertebrates other than nematodes, except worms and invertebrates on or in living man or other animals."

The association postponed for a year tentative approval of a definition for weeds. This definition read, "Any plant or part thereof which grows where not wanted."

The editorial committee reported on progress toward publishing a new edition of the AAPCO handbook, which lists monographs on chemicals used in pesticides and an association roster. It was pointed out that the previous edition listed 162 different chemicals. The 1956 supplement added 26 more and 15 additional monographs were included in the 1957 supplement. It is

(Continued on page 20)

Use of Modern Analytical Equipment Is Urged at NPFI Chemical Control Meeting

By GEORGE W. POTTS
Croplife Staff

WASHINGTON — The first of a planned series of conferences on chemical control problems, sponsored by the National Plant Food Institute, was held at the Hotel Shoreham Oct. 17, under the direction of Dr. Vincent Sauchelli of the NPFI.

The increasing importance of the science of chemistry and the role of analytical and control chemists in all industries, with stress on the fertilizer industry were accentuated in the session.

Dr. Sauchelli, in his introductory remarks, saw the industry as being in a period in which the development of new methods and techniques in analysis is an end in itself and is studied increasingly by specialists in the subject. "Encouragement is being given to analysis by the development of new physical methods and instruments involving the use of spectrographs, polarographs, absorptionmeters, colorimeters and so on," he said.

He saw the analytical chemist of today at a crossroads where he must make a decision "to lead or follow in this rapidly developing field of electronic science."

Noting that technological supremacy is associated with skills in instrumentation, Dr. Sauchelli pointed out that new techniques have revolutionized chemical analysis "but generally the attitude towards analysis displayed in our industry has not changed apace. Nearly every method or technique we employ is worthy of further study to bring about its improvement and refinement. Several competent leaders have recently criticized industry for requiring too many useless analyses. To continue to run analyses merely to see that various substances meet outmoded specifications is, they say, a wasted effort. Assays, they admit, are still necessary. In many industries certification of the analysis by the manufacturer is accepted on the basis of his laboratory's proven competence."

Referring to a recent article about chemical analysis yielding to push-button techniques, Dr. Sauchelli said

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Stauffer to Build Trithion Plant at Henderson, Nev.

NEW YORK—Trithion, the organic phosphate pesticide developed by Stauffer Chemical Company, will move into large-scale production prior to the next crop season, according to Stauffer. Plans have been completed for the construction of a multi-million-pound Trithion plant at Henderson, Nevada. It is anticipated that the new project will be in operation by February.

The unit will serve both domestic and foreign markets, but, according to Dan J. Keating, Stauffer vice president and general manager of the agricultural chemicals division, consideration is also being given to building additional Trithion manufacturing facilities abroad.

The pesticide was developed by Stauffer's research laboratories at Richmond and Mountain View, Cal., four years ago. Since that time, it has moved through two successively larger pilot plants and, during the past season, has been made in a large semi-works plant at Richmond. Trithion chemically is O, O-diethyl S-p-chlorophenylthiomethyl phosphorodithioate.

Rutgers Conference Panel Explores Relationship Between Weather and Fertilizer Use

NEW BRUNSWICK, N.J.—Give a plant a balanced diet and a full meal so it will be ready to go to work when moisture conditions are right.

This general statement sums up the comments of a panel that attempted to get an answer to the question of weather effects on fertilizer practices at the annual Rutgers University fertilizer conference Oct. 3.

Four Rutgers specialists in vegetables, fruits, pastures and field crops discussed the topic against a backdrop of New Jersey's severe drouth this year, and Dr. Willard H. Garman, chief agronomist of the National Plant Food Institute, Washington, offered a summary based on statements from crops and soils men from all sections of the country.

Dr. Garman, recently appointed Northeast regional director for NPFI, noted the tendency of farmers to buy less fertilizer following two or three drouth years. This is explained, he said, by decreased farm income and by the fact that farmers are less optimistic after two or three bad drouth years.

However, "all evidence points to improved efficiency of moisture utilization when plant nutrients are in balance and their supply is adequate," he said.

Dr. John L. Gerwig, extension crops specialist at Rutgers, had made a similar observation earlier in discussing moisture and fertilizer relationships. He said:

"A well nourished crop makes the best use of fertilizer."

Dr. William O. Drinkwater, research specialist in vegetable production, went a step further, saying it's "dangerous to tell a farmer there is an appreciable amount of fertilizer leftover in the soil after a dry season."

Considering New Jersey's 14 major vegetable crops and 20 minor ones, the leaching tendency of many soils of the state and other variables, it's almost impossible to tie down the question of residual fertilizer, he said. Besides, so much of the state's vegetable acreage is under irrigation that a drouth year has to be treated as a normal one.

It's best to keep all minerals in a pasture system at an optimum so that temperature is the only limiting factor, said Dr. M. A. Sprague, chairman of the farm crops department at Rutgers.

Most fruits, including blueberries, made a vegetative growth this year, but some were brought along with irrigation, reported Ernest G. Christ, extension fruit specialist. He said he could see an advantage in fall and winter application of fertilizer to apple trees—or certainly in spring. Peaches will need fertilizer ahead of bloom.

The panel moderator, Dr. Russell B. Alderfer, chairman of the soils department, pointed out that as of the meeting time New Jersey was still in a drouth, with a moisture deficit of as much as three or four feet deep in some areas. A lot of acres in New Jersey, he said, can use as much as a foot of water over the fall and winter.

E. H. (Pete) Brothers, superintendent of the Seabrook Farming Corp. in Cumberland County, New Jersey, described a cover crop program with fertilizer applications sufficient to produce a luxuriant crop. Plowed under, the cover crop enhances the soil properties and makes nutrients available in better form for plant growth.

This plan also helps reduce peaks in deliveries from suppliers.

Mr. Brothers called for more emphasis on soil analysis along with research in weather effects.

In his greetings to the group, Dr. Ordway Starnes, associate director of the New Jersey Experiment Station, mentioned two significant projects under way—the high-nitrogen grassland fertilization studies and tests with crops and vegetables in the so-called Pine Barrens of South Jersey.

Dr. Roy L. Flannery, supervisor of soil testing, explained the mechanics of submitting samples under the new fee system. The laboratory is getting better and more useful samples now, he said.

Dr. Nathan A. Willits, also of Rutgers, whose specialty is irrigation, told about crop response to brackish water irrigation in certain coastal areas.

Dr. Stacy B. Randle, state chemist, was in charge of the conference.

A great deal more needs to be known about the minerals a man must eat to stay healthy and live to a ripe old age, Dr. Firman E. Bear, New Brunswick, editor of "Soil Science," said at the meeting. He reminded fertilizer manufacturers and distributors that a great deal is known about how fertilizer affects plant growth. But can fertilizer cause an imbalance of minerals in plants that man eats?

Dr. Bear referred to an analysis of fruits and vegetables from many sections of the country in which wide variations in minerals were found from west to east and north to south.

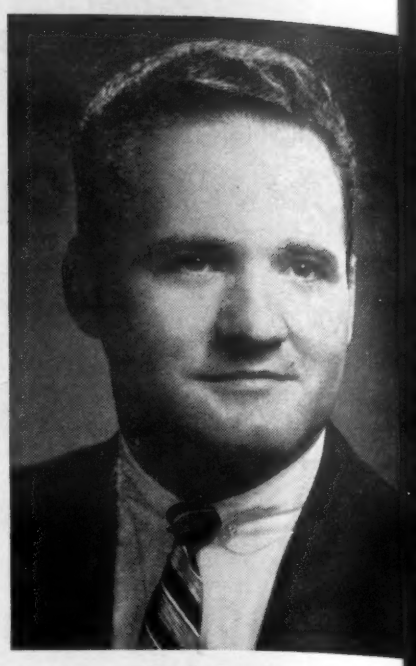
There is an exchange of foods now on a global basis, he pointed out, yet this is done in a hit or miss fashion. In the future there may be a deliberate attempt to exchange foods among nations in the interest of a diet better balanced in minerals.

If this is not possible, why not prepare a salt that will contain more of the mineral elements, beyond the sodium chloride of common table salt? Sea salt approaches this goal, Dr. Bear said, and chemists are finding a way to make it free flowing so that it doesn't clog the shaker as it has in the past.

IRRIGATION SHORT COURSE

LINCOLN, NEB.—An irrigation short course will be held Nov. 18-Dec. 18 at the University of Nebraska here.

J. T. Stevens



R. A. Lemler

Nitrogen Division Names Two in Sales Positions

NEW YORK—Nitrogen Division of Allied Chemical & Dye Corp. has named two supervisors in the sales department. They are J. T. Stevens and R. A. Lemler.

Mr. Stevens becomes district sales supervisor for the South Point, Ohio, district and Mr. Lemler becomes Midwest product supervisor for direct application solutions.

Mr. Stevens has been with the Nitrogen Division since 1953 and has been concerned with the sale of direct application and mixing materials. In his new position, he will supervise both of these sales operations in his district. His headquarters will be at Nitrogen Division's sales office in South Point.

A native of Jamestown, N.Y., and a 1952 graduate of the University of Kentucky, Mr. Stevens holds a B.S. degree in agriculture.

Mr. Lemler joined Nitrogen Division in 1955 as a field sales representative. He has recently been in charge of direct application solution sales in Indiana, and in his new position will supervise these sales in the Midwest. His headquarters will be at Nitrogen Division's sales office in Indianapolis.

Mr. Lemler is a native of Bourdon, Ind., and is a 1953 graduate of Purdue University, which awarded him a B.S. degree in agriculture.

Boll Weevil Research To Be Discussed at Cotton Conference

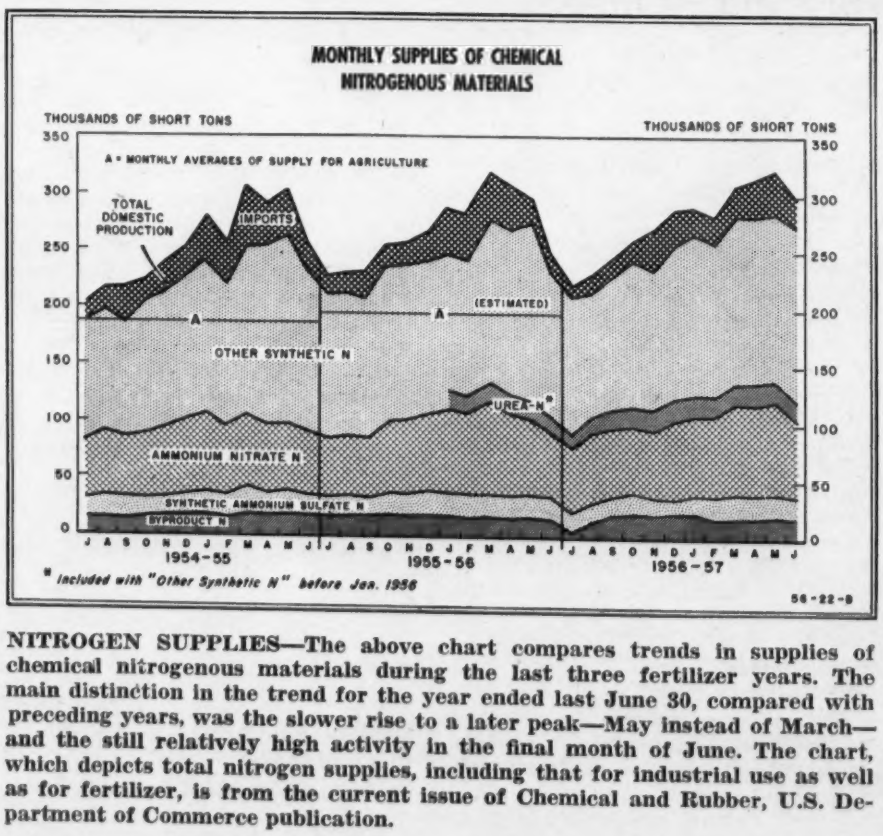
MEMPHIS—Progress of boll weevil and cotton plant research will be reviewed at the third annual Belt-wide Cotton Production Conference at the Peabody Hotel here Dec. 12-13.

The conference is sponsored by the National Cotton Council in cooperation with Cotton Belt land-grant colleges, U.S. Department of Agriculture, agricultural chemical industry, farm organizations and others.

Basic research on the boll weevil and the physiology of the cotton plant will be a feature of the program. Although such research usually takes many years to show useable results, reports indicate that there are promising leads from work on boll weevils and plant physiology after about three years of efforts.

A highlight of the opening session will be a report on the findings and recommendations of the Cotton Task Group of the Presidential Commission on Increased Industrial Use of Agricultural Products. Production research implications will be emphasized.

Other subjects on the program are variety improvement, obtaining uniform stands, disease control, fertilization, insect control, weed control, skip-row planting and effects of current practices on spinning performance of fibers. Special technical meetings on insect control, disease control, defoliation, and cotton genetics and breeding will precede the conference.



NITROGEN SUPPLIES—The above chart compares trends in supplies of chemical nitrogenous materials during the last three fertilizer years. The main distinction in the trend for the year ended last June 30, compared with preceding years, was the slower rise to a later peak—May instead of March—and the still relatively high activity in the final month of June. The chart, which depicts total nitrogen supplies, including that for industrial use as well as for fertilizer, is from the current issue of Chemical and Rubber, U.S. Department of Commerce publication.

IMC Sales, Earnings Show Increase

CHICAGO—International Minerals & Chemical Corp. today reported a 23% gain in net earnings after taxes on an 11% increase in sales for the first fiscal quarter ended Sept. 30.

Earnings were $754,000 compared with $614,000 for the same period a year ago. Sales for the quarter just ended totaled $20,553,000, compared with $18,477,000 in the corresponding 1956-57 period, and Louis Ware, IMC president, noted that this was the sixth consecutive quarter in which sales have exceeded those for the same quarter of the previous year.

Mr. Ware said that the generally improved picture for the first quarter was largely attributable to steadily continuing gains at the company's phosphate chemical processing plant at Bonnie, Fla. He said that other divisions, notably industrial minerals and amino division, were also important contributors to the increased earnings.

Earnings per share of common stock for the period were 28¢ on 2,337,317 shares outstanding, compared with 22¢ on the 2,337,257 outstanding a year ago. Earnings before taxes were $1,019,000 compared with $856,000 for the first quarter of the 1956-57 fiscal year.

Costs of Direct-Payment Price Support Program Estimated

By JOHN CIPPERLY
Croplife Washington Correspondent

WASHINGTON—A system of supporting farmers' prices and incomes by means of direct payments has been under consideration in the U.S. Department of Agriculture and a report has been prepared for Congress estimating the cost of the system. The plan—it can be called a production payment plan, a compensatory payment plan or even a Brannan plan—would cost $7¼ billion a year for 90% support limited to 1952-56 production and over $10.5 billion for unlimited support.

In interpreting these figures USDA points out that they are estimates of gross cost to the government. Net costs would, of course, be lower as most of the current programs for price support and surplus disposal would be abandoned. In 1956, for example, the realized cost of programs primarily for the stabilization of farm prices and incomes totaled nearly $2 billion. On the other hand, no estimates of administrative costs of a payment program have been included.

The large size of the payments for the programs is due to a number of factors including the high support level assumed and the extension of the support program very substantially beyond its present coverage, notably into the livestock sector. The cost is further increased by the large expansion in output that would occur, particularly in the case of the program of unlimited payments.

The principal feature of a direct payment program is that prices of farm products would not be supported in the market but would find their free market level, and any difference between actual prices and the specified price objective would be made up by a direct cash disbursement from the government to the farmer. Because they would compensate for the gap between actual and support prices, direct payments are sometimes called compensatory payments.

Under the program of unlimited payments, an expansion of livestock production would generate a demand for feed grains strong enough to lift feed grain prices close to or above supports, USDA considers. This would stimulate some expansion in corn acreage and output, but the greatest impact would be on wheat, where acreage has been sharply reduced by allotments and quotas.

With feeding demand for it generated by livestock support at 90% of parity and without export subsidy, wheat would be priced out of the export market and would become a major component of the total feed supply. With the great expansion in wheat acreage, and also a considerable expansion in cotton, contraction in acreage of oats, barley and sorghums would be expected, though total output of these grains might show a slight increase due to rising yields.

Alternatives, Underlying Assumptions

Estimates were made on the basis of farm price supports at 90% of parity. Two alternative programs were examined: (1) Direct payments of the difference between 90% of parity and estimated annual market prices, for all marketings; (2) payments limited to a previous volume of marketings, which is calculated as the quantity that moved into domestic disappearance and exports during the five years 1952-56.

In order for the USDA commodity analysts to make estimates of costs under these two programs, it was necessary to make certain general assumptions. The principal ones used were as follows:

- The plan was assumed to apply to all major farm commodities. Under this approach the program costs for any particular commodity differ greatly from those where a direct payments plan is applied only to that commodity or to a small number of commodities.
- Any present excess carryovers would either be withheld from the market, or gradually disposed of in ways that would not affect the domestic level of prices.
- Marketing agreements and orders would remain in force.
- The study was focused ahead to around 1962. This assumption permits the direct payments program to have its effect on production and prices after farmers have had several years in which to make adjustments to it.
- High employment, a stable price level, and a growing population were assumed. Specific economic assumptions included: population up about 8% over 1957; per capita disposable income up about 10%; retail and wholesale prices at about the 1957 level.
- Support prices for individual commodities were assumed to be 90% of modernized parity as based on the price report for August, 1957.
- The commodities included in the analysis were: wheat, rice, corn, oats, barley, grain sorghums, cattle, calves, hogs, sheep, lambs, milk, butterfat, eggs, farm chickens, broilers, turkeys, peanuts, soybeans, cottonseed, cotton, wool, burley tobacco, flue-cured tobacco, potatoes and oranges. These commodities ordinarily account for around 85% of total cash receipts from farm marketings.

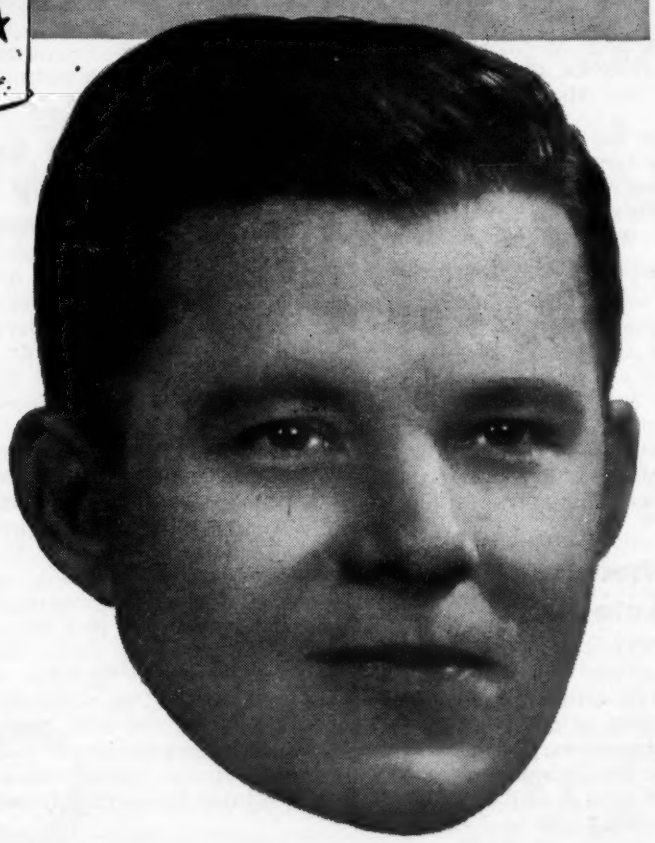
Under these specified conditions, total acreage and output are certain to show marked increases, and certain specific commodity problems will appear, such as the necessity of exporting large volumes of cotton and tobacco and the shift of wheat from an export crop to a feed grain.

Implications of payments programs based on other assumptions could be quite different. For example, costs would be very greatly increased if the support level were raised to 100% of parity. On the other hand, costs could be substantially reduced if the support level were lowered, say to 75% of parity; if greater restrictions were placed on payments; or if the payments were confined to a smaller group of commodities. Under these different assumptions, the allocation of costs by commodity would also show a wide degree of variation.

SHORT COURSE PLANNED

RALEIGH, N.C.—The North Carolina Pest Control Operators' Short Course will be held at the College Union, Raleigh, on February 4-6, according to an announcement made by Clyde F. Smith, head, department of entomology at North Carolina State College.

THE MAN WITH THE MULTIWALL PLAN



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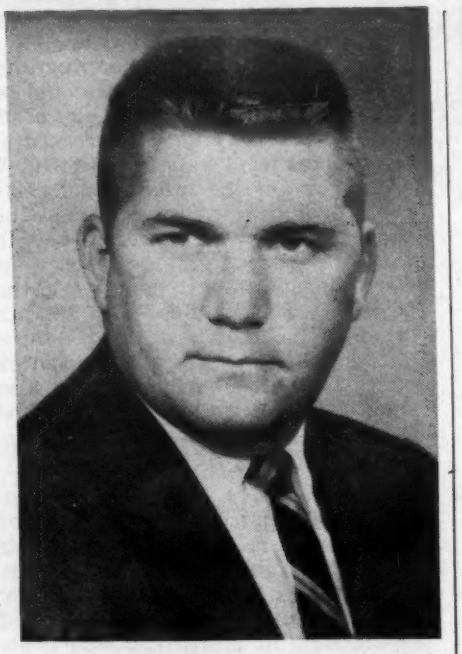


William H. Bricker

JOINS CHEMAGRO—William H. Bricker has been appointed sales representative for Chemagro Corp. in Michigan, Ohio and the eastern portions of Indiana and Kentucky. Mr. Bricker previously served as branch manager for California Spray Chemical Corp. in the Midwest region. A graduate of Michigan State University, Mr. Bricker also served as a vocational agricultural instructor in Owosso High School in Michigan. His Chemagro regional headquarters have been established in St. Joseph, Mich.

August Super Output Gains Over Year Ago

WASHINGTON—Production of superphosphate and other phosphatic materials during August totaled 170,620 short tons, compared with 143,456 short tons in August, 1956, the Bureau of the Census has reported.

August shipments amounted to 117,723 short tons, a gain from 98,367 tons in the same month last year. Stocks on hand at the end of last August totaled 320,396 short tons, compared with 406,665 short tons a year earlier.

Production last August included 91,899 short tons of normal and enriched, 63,787 short tons of concentrated and 14,934 short tons of other phosphatic fertilizers, including wet-base goods.

Spencer Sales, Profits Up in First Quarter

KANSAS CITY—Net sales and profits of Spencer Chemical Co. in the three months ended Sept. 30—the first quarter of its fiscal year—were larger than a year ago. Contributing to the improved showing were gains from polyethylene business, and better sales of certain nitrogen materials, the company said.

The September quarter continues to be seasonally the period of lowest sales and profits for the company. However, this September substantial sales of certain nitrogen materials were made to customers anticipating an Oct. 1 price increase which previously had been announced.

Furthermore, the company said, an improvement in the general market for nitrogen, as compared with a year ago, has been noted because of more favorable weather conditions in much of the company's trade area. A year ago the Middle West and Southwest had been plagued by a long drouth, which now appears to be broken.

Net sales for the quarter were $10,719,743 up from $9,070,672 a year before. Earnings before taxes were $1,724,332, against $1,518,519 for the same quarter last year. Net income was $835,332, equal to 62¢ a common share, compared with $733,519, or 52¢ a share, a year ago. Directors have voted the usual quarterly dividends of 60¢ on the common and $1.05 on the preferred, both payable Dec. 1 to holders of record Nov. 8.

INSECT AND PLANT DISEASE NOTES

Cool Weather Fails to Halt Pests in Colorado

FORT COLLINS, COLO. — Some insects simply refuse to give in to cool weather. The spotted alfalfa aphid is an example. After a slow start this summer, populations of this insect grew to economic proportions in the Arkansas Valley in early August.

Field surveys showed the numbers held fairly steady for several weeks, then dropped to insignificant levels in September.

Now, however, according to the Oct. 8 report of the Colorado Insect Detection Committee, the count at Fowler in Otero county is 4,000 per 100 sweeps. Farther up the Arkansas river, Vineland in Pueblo county has populations averaging 1800 per 100 sweeps.

Infestations of the spotted alfalfa aphid, however, are much smaller than they were last year, according to the committee.

Another insect still very much alive is the pale western cutworm, currently using Yuma county as the center of its activities. Smaller populations of the pale western cutworm are also in evidence in Washington, Weld, Otero and Mesa counties.

Bait traps at Windsor in Weld county show large numbers of fruit flies, and very few specimens of the seed corn maggot, spinach leaf miner and western wheat stem maggot.

In Pueblo and Otero counties, egg counts on the tomato fruit worm amounted to an average of two per 100 leaves at all stations.

The army cutworm is still active in Washington, Weld and Otero counties, and the dingy cutworm is in evidence in Mesa county. All of these counties report damage from the corn earworm.

Sawfly Losses Heavy in North Dakota Area

FARGO, N.D.—Wheat stem sawfly infestation cost northwest North Dakota farmers an estimated loss of 1,682,030 bushels of wheat this year. This figure, represents 6.5% of total production in the 11-county area surveyed, says Wayne J. Colberg, NDAC extension entomologist.

Infestation ranged from a trace to 10% in Divide, Williams and parts of Sheridan, Ward, Pierce, McHenry and McLean counties to a 51 to 100% infestation in much of McLean and parts of Mountrail and Ward counties.

In 1955, 16 counties in the area reported an estimated loss of 1,987,545 bushels and in 1956 a loss of 2,197,022 bushels in 12 counties.

The estimates are preliminary, Mr. Colberg says, and may differ slightly from the final estimates published.

Black Stem Disease in Minnesota Damages Crops

ST. PAUL, MINN. — Black stem disease resulted in an estimated 10% loss of the 1957 alfalfa crop in Minnesota, according to Bobby Renfro, plant pathologist at the University of Minnesota. He said damage was 3-5% higher in the state than during the past two years. Reason for the greater damage was prolonged periods of wet weather during the past summer, he explained.

Mr. Renfro said that at present, the most practical means of controlling black stem is through developing resistant alfalfa varieties. There has already been some progress in selecting individual plants with black stem resistance.

He added that cultural practices can help reduce damage from black stem disease. This organism attacks alfalfa in early spring and in fall, but usually isn't severe on second-crop alfalfa in mid-summer.

Wyoming Alfalfa Fields Threatened by Dodder

LARAMIE, WYO.—Dodder, a serious weed pest, has invaded some Riverton alfalfa fields, the University of Wyoming says. Reported just recently near Riverton, the noxious weed can cause serious economic loss to Wyoming seed growers.

Scientists at the University of Wyoming have urged growers to remove dodder from their alfalfa seed fields before harvest. Alfalfa seed contaminated with dodder is unsalable without special cleaning. The recommendation comes from the Agricultural Experiment Station and from U.S. Department of Agriculture researchers who have been studying dodder control for 3 years at the University.

A parasite, dodder twines about alfalfa plants and reduces crop yields as well as contaminates seed. It appears in small patches of matted alfalfa. Seed heads, yellow-green to white colored balls in summer, turn brown in the fall.

Eradication of Pest Seen By New Jersey Group

TRENTON, N.J. — The white-fringed beetle is now at the point of eradication in New Jersey, according to Frank A. Soraci, director, Division of Plant Industry, New Jersey Department of Agriculture. Mr. Soraci, who has directed control measures since the white-fringed beetle first appeared in New Jersey in 1954, states that "intensive surveys conducted over the past three years show that this threat to our agriculture has now been met and removed."

While some additional scouting and checking will be necessary in the future, he believes that the quarantine order covering areas where the pest appeared may be lifted within a year. Credit for this accomplishment, he said, is shared with the affected growers, who were most cooperative throughout the work, and with the Agricultural Research Service of the U.S. Department of Agriculture who gave timely support of men and equipment.

The discovery of the white-fringed beetle in a sweet potato field near Vineland in 1954 was the first occurrence of the pest north of North Carolina. Damage was so severe that the crop was completely unmarketable. An eradication program was immediately put into operation and the infestation was limited to about 350 acres.

The successful control program was accomplished at a total cost of less than $30,000, Mr. Soraci pointed out, and has undoubtedly saved farmers hundreds of thousands of dollars in losses due to crop damage.

Like the Japanese beetle, one of the most alarming pests which ever entered America, the white-fringed beetle is a voracious and undiscriminating feeder. It attacks some 350 different plants, including practically all of New Jersey's important agricultural crops. Corn, tomatoes, potatoes, beans, cabbage, peppers, lettuce and spinach are among the crops it damages.

Fall Armyworm a Threat in Tennessee

KNOXVILLE, TENN.—Farmers in Tennessee have been warned by R. P. Mullett, University of Tennessee entomologist, that the fall army worm is likely to build up in numbers sufficient to attack all types of pasture and legume fields, as well as stands of sudan grass, alfalfa and small grain.

He said that budworms now infesting corn are being called the corn earworm, whereas actually they are the "advanced members of the fall armyworm and will continue to multiply to cause later heavier infestations."

Growers are advised by Mr. Mullett not to wait for developments when these pests are found, but to undertake immediate control measures.

Witchweed in South Carolina

CLEMSON, S.C. — Witchweed is being found on more farms in South Carolina. The number infested in Herry County is now 108; in Marion County, 68; and in Marlboro County, 32. Witchweed in corn fields has diminished since harvest, but is still growing and blooming in grass areas of the state.

Forest Insects do Extensive Tree Damage On 3,000,000 Acres in Southwest Area

ALBUQUERQUE, N.M. — Drouth-aided insects have piled up a new all-time high in forest destruction in the Southwest.

About three million acres—or one third of the commercial forest acreage of New Mexico and Arizona—are now infested with tree-destroying insects, says Dr. C. L. Massey, head of the U.S. Forest Service insect laboratory here. He made his estimates on the basis of a recent annual aerial survey of the nine million acres of forest in the two states.

In the survey of Sept. 1, 1956, the infestation figure was about one and a half million acres. By September of this year, the infestation had doubled. The big increase is largely attributable to the spread of various pine beetles. Their combined infestation quadrupled from an estimated 425,000 acres in 1956 to some 1,711,000 acres this year. Infestation of Douglas fir timber by similar beetles rose from 437,000 acres in 1956 to 821,000 acres.

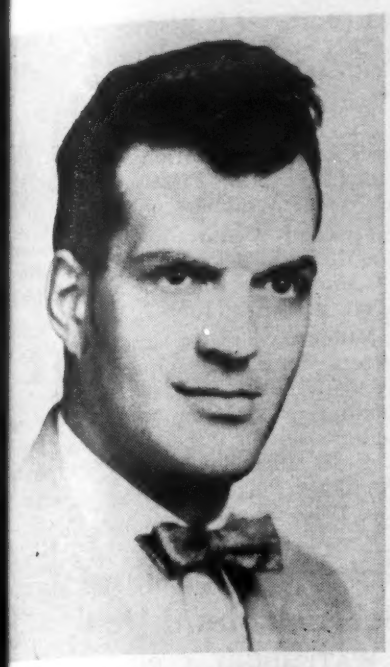
This buildup was largely caused by a decade of drouth, says Dr. Massey. It has weakened trees until they become easy prey for the various ravagers. Although 1957 has been a relatively rainy year in the two states, one year of moisture is not enough to offset the great buildup of insects.

A total of 610 million board feet of timber was destroyed by insects in the two states in the year ending Sept. 1. This represents a monetary loss of $6 million, and is about three times as much as the insect loss of the previous year.

In addition to financial losses, the beauty of Southwestern recreational areas is impaired. At Bandelier National Monument, for instance, an outbreak of the Arizona pine engraver beetle is taking a noticeable toll of pinon and marginal pine.

Dr. Massey offered a little good news along with the bad. He said that the spruce bud worm—once a major tree killer in the Southwest—has been brought under control through spraying, and progress is being made in control of the tent caterpillar, a pest that defoliates the aspens.

But adequate weapons against the southwestern pine beetle have yet to be found, Dr. Massey said.



Kendall S. Tomlinson

ADE SALES MANAGER—Kendall Tomlinson has been appointed sales anager for farm fertilizers by Lebanon Chemical Corp., Lebanon, Pa., ernon S. Bishop, president, has announced. Mr. Tomlinson was formerly ortheast area sales manager of the itrogen Division of Allied Chemical Dye Corp. He is a native of Pennylvania and holds a B.S. degree from enn State University.

Spencer Chemical Dedicates New Research Center

KANSAS CITY—Spencer Chemical o.'s new research center in subrban Kansas City was dedicated Oct. 2. It will be devoted to research and evelopment of new and improved roducts in the general fields of agicultural and industrial chemicals nd plastics.

Highlight of the dedication was the resentation of a bronze plaque recgnizing his "contributions to and ontinuing interest in research" to enneth A. Spencer, president of the hemical company.

The plaque presentation came at he conclusion of dedication ceremonies which included a tour of the ew center, a dinner at the Kansas ity Country Club and an address by r. Charles N. Kimball, president of he Midwest Research Institute. The laque presentation was made by Arhur Mag, secretaary of Spencer, on ehalf of the company's board of directors who initiated and sponsored he plaque.

In citing reasons for the recognion, Mr. Mag said that completion of he new research center exemplifies he way that Mr. Spencer has supported an active research program or his company. In addition, he recalled that Mr. Spencer was one of he founders and a member of the oard of trustees of Kansas City's idwest Research Institute and that e has long been interested in better ays of doing things—in particular better ways of utilizing the Midest's resources.

The center is located in Johnson ounty, Kansas, 12 miles from downown Kansas City. It consists of a ain administrative-laboratory buildng, a separate process laboratory and greenhouse for biological research, nd is situated on a 48-acre tract. Inially about 75 to 100 people will e employed there, about half being rofessionally trained chemists and ngineers and the balance, technicians nd clerical workers. Until the comletion of the new research facility, he company's chemical research labratories were located at its Jayhawk Works, 20 miles south of Pittsburg, Kansas.

Diamond Sales Up, Earnings Decline

CLEVELAND — Sales of Diamond Alkali Co., Cleveland, for the nine months ended Sept. 30 were 2% ahead of the same 1956 period but earnings declined 22%, it was reported here by Raymond F. Evans, chairman and president. Net sales of Diamond chemicals for the current nine months' period ended Sept. 30 totaled $97,634,209 compared with $95,459,557 a year ago.

Net income for the first three quarters of 1957 amounted to $6,165,791 against $7,865,387 for the corresponding period in 1956. This is equivalent to $2.28 per common share on 2,703,753 shares outstanding compared to $2.91 per share in 1956 on the same number of shares.

Commenting on results for the nine months, Mr. Evans said that the company's higher sales-lower earnings pattern reflects a "squeezing" trend that has continued throughout 1957.

"This trend is due chiefly to the continuing upward spiral of the cost of transportation, raw materials and labor, our accelerated research program and heavy charges resulting from retirement of old and obsolete facilities," Mr. Evans said. "Throughout our organization, we are intensifying our efforts to improve profit planning and performance in fighting the battle of the cost-price squeeze."

COTTON YIELD DOWN

STATE COLLEGE, N.M.—New Mexico's cotton crop for 1957 is forecast at 285,000 bales based on conditions as of Oct. 1. This is about 16,000 bales less than was produced in 1956. The estimate includes both long and short staple cotton. The predicted yield per acre for the state this year is 756 lb. compared to 797 lb. per acre in 1956. Acres for harvest in the state this year is 181,000.

17.3 Million Acre Allotment Set for Upland Cotton Crop

WASHINGTON — A national marketing quota of 11,920,290 bales (standard bales of 500 lb. gross weight) and a national acreage allotment of 17,391,304 acres for the 1958 crop of upland cotton have been proclaimed by Ezra Taft Benson, secretary of agriculture.

The national acreage allotment for 1958 is the same as for the 1956 crop (as was the case also for the 1957 crop), and the national marketing quota has been set at the number of bales required to provide an acreage allotment of this size.

The secretary also announced that a referendum on upland cotton marketing quotas will be held on Dec. 10, 1957. At least two-thirds of the upland cotton farmers voting in the referendum must approve marketing quotas if they are to be effective.

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U.S.I. FEED NEWS

Vol. IV No. 10 ★ A SERIES FOR SCIENTISTS AND EXECUTIVES OF THE FEED MANUFACTURING INDUSTRY ★ October, 1957

Further Evidence Shows Amino Acid Balance Is Key To Protein Value

The importance of amino acid balance to protein utilization and maximum growth rate was emphasized in a report made before a meeting of experimental biologists. The report contained evidence that at least six amino acids—methionine, phenylalanine, histidine, leucine, isoleucine and valine—must be balanced in the diet if maximum benefit is to be derived from dietary protein.

Previous research has indicated that the amino acid most likely to be deficient in feedstuffs is methionine. Thus, when supplementary methionine is added to the ration to balance the amino acids already present, considerable increase in growth may be obtained.

PIONEER PRODUCER OF METHIONINE U.S.I. U.S.I.

Riboflavin Overcomes Boron's Growth Inhibition

A European microbiologist has found that riboflavin overcomes the growth inhibition of test organisms caused by boron. None of the other B vitamins has this effect.

These findings may have some importance in areas such as the American southwest where the soil has a high boron content. Boron is taken from the soil by plants which are commonly used in making feedstuffs.

U. S. I. to Market Liquid Feed Based On New Concept in Ruminant Nutrition

MOREA® Feed Produces More Economical Weight Gains in Cattle

U.S.I. will market a new liquid feed supplement that has made an impressive record in the Midwest for promoting economical weight gains in cattle with a correspondingly higher carcass grade than could be expected from the "on the hoof" grade.

Called MOREA, the liquid feed is based on a completely new concept in ruminant nutrition. By satisfying the nutritional requirements of specific rumen micro-organisms, the supplement accelerates rumen fermentation processes, enabling cattle and sheep to eat and assimilate more feed in a shorter time.

More Weight with Less Feed

MOREA liquid feed is the result of several years of research and has been sold for some time in the Midwest. Performance of the supplement under test market conditions has been unusually good. In trials, range calves without grain feeding which were fed the new supplement averaged 300 pounds heavier at 18 months than calves raised in the conventional manner with protein supplements. Animals fed MOREA consumed noticeably less grass. Tests have also shown that MOREA upgrades meat quality, producing more tender, meaty carcasses with less waste fat. Similar results have been obtained when lambs were fed MOREA, and dairy cattle fed the supplement have shown significantly increased butter fat and milk solids production.

A liquid MOREA feeder for cattle designed with special nose guard float.

As reported in USI FEED NEWS last month, the supplement is able to supply complete protein nitrogen from urea, with extremely good apparent nutrient digestibility. In addition to urea, the new liquid feed contains molasses, phosphoric acid, ethanol and trace minerals.

Can Be Fed Year Round

MOREA can be fed free choice to cattle at all stages of their development. It will not freeze in winter and can be fed year round. It does not attract flies.

U.S.I. will sell a concentrated liquid MOREA premix to feed mixers who will blend the concentrate with molasses. U.S.I. is a basic producer of the ethanol and phosphoric acid contained in the premix. The market area includes most states east of the Mississippi and west of the Continental Divide. The company is currently appointing manufacturers who will mix and distribute the finished MOREA to feeders.

FEED PRODUCTS OF U.S.I.

- U.S.I. ANTIBIOTIC FEED SUPPLEMENTS (bacitracin and procaine penicillin)
- U.S.I. VITAMIN B_{12} SUPPLEMENTS
- U.S.I. MENADIONE PRODUCTS (vitamin K_3)
- U.S.I. BHT PRODUCTS
- U.S.I. RIBOFLAVIN PRODUCTS
- U.S.I. CHOLINE CHLORIDE (25% dry or 70% solution)
- U.S.I. NIACIN
- U.S.I. CALCIUM PANTOTHENATE Products
- U.S.I. DL-METHIONINE (feed grade)
- U.S.I. PERMADRY (sealed-in vitamin A)
- U.S.I. VITAMIN D_3 (stabilized)
- U.S.I. CUSTOM MIXES
- U.S.I. VITAMIN E PRODUCTS

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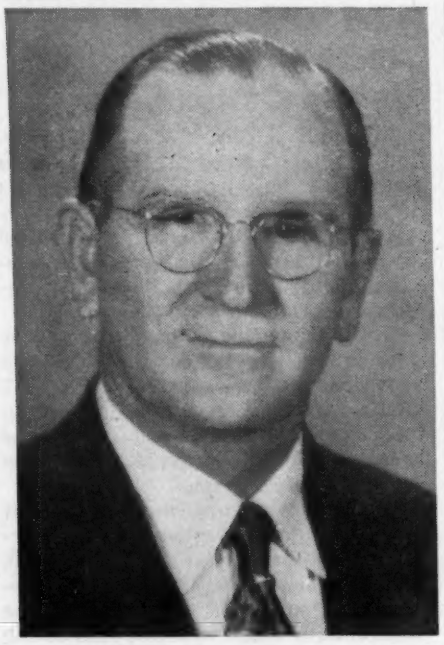


Cleve H. Tandy

Cleve H. Tandy, Head Of Port Fertilizer and Chemical Co., Dies

LOS FRESNOS, TEXAS—Cleve H. Tandy, chairman of the board of the Port Fertilizer and Chemical Co. of Los Fresnos, Texas, died at his home near Brownsville Oct. 18. He was 62 years old. He had been in ill health for some time but had continued to be active in business and civic affairs until his death.

Mr. Tandy was born in Bosque County, Texas, near Waco, in 1894. He came to the Rio Grande Valley in 1907 with his father, the late A. N. Tandy, and two brothers, David L. and Clyde. The family operations included cotton gins, extensive farming operations, banking and in recent years, the Port Fertilizer and Chemical Co., which was started by Clyde Tandy in 1933. Cleve Tandy took over the presidency of the company in 1949, after his brother's death in 1948.

Mr. Tandy is survived by his wife Evelyn; his brother Dave; and his daughter, Mrs. Doug Earley. His nephew, Clyde Tandy, Jr., and his son-in-law, Doug Earley, are both active in the Port Fertilizer and Chemical Co. On Oct. 5, a few days before his death, Mr. Tandy was elected chairman of the board of Port Fertilizer and Chemical Co., and John Chase, formerly general manager, was elected president.

A subsidiary company, the Port Chemical Co. of Elsa, managed by E. B. DuBuisson, will continue to be operated by the parent company as in the past. The many interlocking warehouses, branches and independent dealerships set up by the parent company will continue on the same plan. No major changes in policy are anticipated, company officials said.

Cleve Tandy was well known in the cotton industry. He had served as a member of the National Cotton Council, the Texas Cotton Ginners' Assn., the Statewide Pink Bollworm Committee and as chairman of the Rio Grande Valley Cotton Assn. In recent years, one of his main interests was in education and research and under his leadership, the Brownsville Junior College was formed into the Texas Southmost College. He served as first chairman of the board of the educational institution. Mr. Tandy also served on the National Council of Boy Scouts.

South Carolina Tonnage

CLEMSON, S.C. — South Carolina fertilizer use during September totaled 23,822 tons, compared with 18,344 tons in September, 1956, according to the South Carolina Department of Fertilizer Inspection and Analysis. Sales during the first three months of this fiscal year (July-September) totaled 48,486 tons, a gain of more than 12% over 43,019 tons in a corresponding period a year earlier.

Industry Patents and Trademarks

2,809,897

Fungicidal Coating Compositions. Patent issued Oct. 15, 1957, to Edward R. Christensen and John E. Tessieri, Beacon, N.Y., assignors to the Texas Co., New York. A fungus-resistant composition consisting essentially of asphalt and 0.05-10% of a salt of dithiofuroic acid selected from the group consisting of groups I and II metal salts.

2,809,980

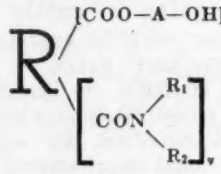
Fungicidally-Active S-Alkylisothiourea Salts of Reinecke Acid. Patent issued Oct. 15, 1957, to Johannes Thomas Hackmann, Amsterdam, Netherlands, assignor to Shell Development Co., New York. As a new compound, the simple s-alkylisothiourea salt of tetrathiocyanodiammonochromic acid.

2,809,147

Insecticidal Film-Forming Composition and Method of Making Same. Patent issued Oct. 8, 1957, to Irwin Hornstein, East Riverdale, Md., and William N. Sullivan, Washington, D.C., dedicated to the public. An insecticidal composition comprising a chlorinated hydrocarbon insecticide and a film forming chlorinated terphenyl.

2,808,359

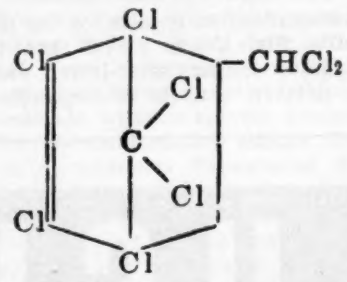
Insect Repellent Compositions of Hydroxy-Alkyl Esters of Polybasic Organic Acids and Methods of Using Same. Patent issued Oct. 1, 1957, to Alfred F. Schmutzler, Summit, N.J. A method of repelling insects which comprises applying an insect repelling composition to the area to be made repellent, said composition including a relatively volatile organic liquid diluent and a viscous liquid ester of the following composition:



wherein R is the residue of a polycarboxylic acid selected from the group consisting of an aliphatic acid, aromatic acid and a cycloaliphatic acid; A is selected from the group consisting of an aliphatic group, an alkoxyaliphatic group and a polyalkoxyaliphatic group; R_1 and R_2 are selected from the group consisting of hydrogen, an aliphatic group, an aryl group, a cycloaliphatic group and a hydroxyalkyl group; x plus y equals 2-6, x equals 1-6, y equals 0-2, said ester being relatively non-volatile upon live human and other animal skin under ordinary atmospheric conditions and said diluent serving to improve the effective repellency range of said ester, the composition being characterized by its long period of repellency.

2,806,813

Insecticidal Compositions Comprising 2 - (dichloromethyl) - 1,4,5,6,7,7 - Hexachloro - bicyclo[2.2.1]-5-Heptene. Patent issued Sept. 17, 1957, to Albert H. Haubein, Christiana, Del., assignor to Hercules Powder Co., Wilmington, Del. A compound represented by the planar structural formula



said compound having a boiling point range of 135-148° C./0.6 mm. An insecticidal composition comprising the compound of the previous claim and an insecticidal adjuvant as a carrier therefor.

Industry Trade Marks

The following trade marks were published in the Official Gazette of the U.S. Patent Office in compliance with section 12 (a) of the Trademark Act of 1946. Notice of opposition under section 13 may be filed within 30 days of publication in the Gazette. (See Rules 20.1 to 20.5.) As provided by Section 31 of the act, a fee of $25 must accompany each notice of opposition.

Herbisan, in capital letters, for phytotoxic chemical composition to be applied to plants and seedlings. Filed Dec. 29, 1955, by Roberts Chemicals, Inc., Nitro, W. Va. First use April 9, 1953.

Bridgeport, in script letters within diamond-shaped frame, for weed killer. Filed Jan. 13, 1956, by Bridgeport Brass Co., Bridgeport, Conn. First use Feb. 15, 1955.

E-Z Off, for defoliants. Filed April 5, 1956, by Allied Chemical & Dye Corp, New York. First use Sept. 16, 1953.

Red and Blue Chevron Design, for fertilizers, soil conditioners, soil amendments, soil correctives, chemical preparations to prevent premature dropping of fruits and vegetables from trees and plants, and plant hormones. Filed Aug. 9, 1957, by Standard Oil Co. of California, San Francisco, Cal. First use June 25, 1956, on fertilizers.

Bait-Tox, in capital letters, for insecticides and rodenticides. Filed June 25, 1956, by Sanitation Products Co., Charlotte, N.C. First use April 30, 1955, on insecticides.

Mist of Cedar, in hand-lettered script, for insect repellent. Filed Nov. 19, 1956, by Spritz, Inc., Royal Oak, Mich. First use June 7, 1956.

Miller Hy-Tox, in hand-drawn open letters, for insect spray, insect dust, fly bait, sulfur, oil, tar, and copper dusting or spraying for agricultural and household insecticide uses. Filed Oct. 18, 1956, by Miller Chemical & Fertilizer Corp., Baltimore, Md. First use, 1940.

HEAD PACIFIC NORTHWEST GROUP—Officers of the Pacific Northwest Plant Food Assn. are shown above. From left to right they are Frank Taylor, Oregon-Washington Fertilizer Co., Seattle, president; Ray Whitcomb, Link Distributing Co., Grandview, Wash., vice president; Leon S. Jackson, Portland, secretary, and Henning Waltersdorph, Magnolia Fertilizer Co., Seattle, treasurer. They were named at the recent annual meeting of the association, held in Sun Valley, Idaho. (Croplife, page 1, Oct. 14).

Ralph W. Donaldson Joins Hubbard-Hall

WATERBURY, CONN.—The Hubbard-Hall Chemical Co. here has announced the appointment of Prof. Ralph W. Donaldson, recently retired as extension agronomist of the University of Massachusetts, to the position of consulting agronomist of Hubbard-Hall's agricultural division.

In this newly created post, Prof. Donaldson will work closely with farmers throughout southern New England, assisting and advising them on soil problems and proper crop fertilization practices. He will act as liaison between the Hubbard-Hall Chemical Co. and extension and agricultural education authorities throughout the northeast.

Prof. Donaldson retired in July, as extension agronomist of the University of Massachusetts at Amherst after 32 years of extension work in agricultural education.

Born in Nova Scotia on a fruit and dairy farm, he obtained his B.A. at Acadia University and a B.S.A. from Toronto University. Before coming to Massachusetts, he spent five years as field supervisor for the Soldier Settlement Boards of Canada in the work of establishing veterans on farms.

In 1925 he resigned and moved to Waltham, and became an associate county agent in Middlesex County. Mr. Donaldson was appointed extension agronomist in 1928 and moved to Amherst.

As extension agronomist, he helped introduce the use of borax in Massachusetts 25 years ago as the remedy for boron deficiency existing in rutabagas, certain other vegetables and legume crops. He also promoted Potato Clubs, which emphasized benefits of thorough spraying and the efficient use of fertilizer and certified seed.

James L. App Named V-C Agronomist

RICHMOND, VA.—James L. App of Fairmont, Minn. has been named Midwest agronomist for the Virginia-Carolina Chemical Corp., according to an announcement by A. P. Gates, general sales manager of the company's fertilizer division. Mr. App is a graduate of the University of Minnesota, and has a degree in agricultural education.

The new agronomist will be located in Dubuque, Iowa, and will travel extensively throughout the Midwest. He will offer technical assistance to V-C dealers and their customers. As a part of this assistance, Mr. App will conduct fertilizer meetings, promote soil testing, and work closely with other agronomists and extension men in the Midwest.

In addition to his agriculture degree, Mr. App has had an extensive farm background and has been active in many farm club groups. He won the 4-H soil conservation award for four years, and the F.F.A. soil conservation award for two years. In 1953, he won the Minnesota F.F.A. public speaking contest, and, in 1954, the county soil conservation award.

Frank W. Miller

Frank W. Miller To Head Midwest Sales For Diamond Black Leaf

CLEVELAND—Appointment of Frank W. Miller to the position of sales manager for the Midwest district has been announced here by Emil C. Gerdes, commercial products' manager for Diamond Black Leaf Products, a unit of the Diamond Alkali Co.

Mr. Miller will direct the sale of Diamond Black Leaf agricultural insecticides and herbicides in a 16-state Midwest area. He will make his headquarters in Des Moines.

Prior to joining the Black Leaf staff, Mr. Miller was sales manager for the Staley Milling Co., Kansas City, Mo. He joined the company as a salesman in 1947. A native of Missouri, Mr. Miller is a graduate of Missouri University and holds a B.S. degree in business administration and sales management.

Preparations Started For Eradication of Screwworm in Southeast

WASHINGTON—Plans are being drawn and preliminary work is under way for a program to eradicate the screwworm in the southeastern U.S., the U.S. Department of Agriculture and the Florida Livestock Board, co-operators in the effort, announced Oct. 17.

Screwworm infestation of livestock in the Southeast causes an estimated annual damage of $10 million to $20 million in animals killed, deformed, and made susceptible to other diseases; in lowered production; and in costs of extra labor and medication. The Florida legislature has voted an appropriation of $3 million for 2 years of this work, and the U.S. Congress has voted $1.6 million for the first year.

Eradication activities will take place almost entirely in peninsular Florida. However, the program is visualized as extending 100 miles north of the average overwintering line, to include most of the northern Florida peninsula and the southeastern corner of Georgia.

The eradication program will be conducted by release of sterilized laboratory-reared male flies. The female screwworm fly mates only once, and USDA research has indicated that the fly can be exterminated by maintaining a preponderance of sterile males.

Darling Appointment

CHICAGO—Darling & Co. has announced the appointment of R. P. Trauth as manager of the chemical division. Mr. Trauth is succeeding Mr. Weatherhead who retired Oct. 1. The firm also announced the appointment of L. Strauf as sales manager of Darling's chemical division.

Cover Crops Help Maintain Soil Structure, USDA Says

WASHINGTON—Winter cover crops that reclaim lost plant nutrients, provide organic matter and prevent erosion can also play an important role in maintaining granular soil structure, the U.S. Department of Agriculture says.

Soil-management specialists at USDA's Agricultural Research Center, Beltsville, Md., have found that cover crops planted early in the fall insulate the soil and prevent damage to soil structure by repeated freezing and thawing.

Recommended cover crops include rye and other cereals, rye grass, annual bromegrass, vetch and crimson clover. They may be used singly or in combination, depending on local conditions.

Although repeated freezing and thawing during the winter may improve soil by breaking up clods, these forces are frequently detrimental to soil-aggregate structure (clustering of fine soil particles) under certain field conditions.

The researchers point out that the protective insulation provided by vegetation helps reduce the number of times a soil freezes during the winter and the depth to which frost penetrates. Cover crops also promote and help to maintain large populations of earthworms and other earth-boring organisms, which increase infiltration and speed up drainage of excess water from the surface soil.

Laboratory and field tests at Beltsville indicate that breakdown of soil aggregates is a major problem in wet soils where freezing and thawing take place several times during the winter months. This is a particularly common occurrence in the Middle Atlantic states.

Freezing and thawing on unprotected fields cause slumping of the soil granules when they become wet. This condition leads to surface puddling, followed by crusting and cracking as the soil dries out in the spring.

In experiments conducted last year, a rye cover crop, fall-seeded on clean plowed ground, prevented loss of soil-structure stability during the winter. Drilled at a 7-inch row spacing, the crop reached a height of approximately 5 inches and filled in about half of the area between the rows before cold weather retarded growth. Tests of soil samples showed that this cover furnished enough protection to reduce substantially the amount of structural damage to the soil caused by repeated freezing and thawing.

In other trials conducted by USDA researchers, different methods of tillage and replacement of crop residues resulted in varying rates of soil deterioration in corn plots formerly in sod.

Corn was grown each year with a winter cover crop of rye or vetch. Tillage variations included plowing, plow-depth tillage with sweeps, and a mulch-till "once-over" planter. Residues were chopped and disked and either turned under or left on the surface.

In the spring, soil samples taken from these plots were immersed in water to determine their structural condition. Soil from plots where the mulch-till planter was used and vegetation was left on the surface showed the least amount of breakdown in soil aggregates.

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SOIL FERTILITY (1955)
C. E. Millar, Professor Emeritus of Soil Science, Michigan State College.

A fundamental treatment of the principles of fertility in the soil, with major emphasis on the plant itself. Relevant aspects of soil chemistry, soil physics, soil microbiology and plant physiology from viewpoint of their influence on plant growth. Each major plant food element and the more important micro-nutrients fully treated with respect to supply in the soil, sources and amounts of additions, losses from the soil, functions in plant growth and plant symptoms of deficiency. Covers all sections, with considerable space to saline soils and soils of southern latitudes **$6.75**

CHEMISTRY OF THE SOIL (1955)
Firman E. Bear

Presents a comprehensive picture of the chemical aspects of soils in relation to their development, present constitution and the uses to which they are put. Covers: chemical composition, soil, colloids, organic matter relationships, oxidation-reduction phenomena, acid, alkaline and saline soils, plant nutrition, nutrient fixation, trace element chemistry, root and soil relationships. Scientists engaged in soil research will find useful data directly applicable to their investigations. Food chemists, manufacturers and those manufacturing liming materials, fertilizers, soil conditioners, surfactants, wetting agents, insecticides, fungicides and other agricultural chemicals will gain new ideas for future product research and development. 384 pages **$8.75**

SOIL PHYSICS—Third Edition (1956)
Dr. L. D. Baver, Director Experiment Station Hawaiian Sugar Planters Association

This represents a considerable revision of the earlier versions and incorporates many ideas communicated to the author by soil scientists all over the world. Two new chapters on the principles of soil irrigation and drainage, discussion on soil puddlability, effect of chemical soil conditions on soil structure, and recent contributions of the diffusion process in soil aeration, and information on hydraulic conductivity, soil moisture stress and plant growth, the importance of compaction on soil tillage, and wind erosion processes. 489 pages **$7.75**

SOILS AND SOIL MANAGEMENT
A. F. Gustafson

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The theme of the book is the necessity of chemical fertilizers to maintain the fertility of the soil. It has concise information on which soil conditions and which chemical fertilizers are most suited for special crops and vegetables. Space is devoted to cereal crops, barley, wheat, oats and rye; to roots and tubers, sugar beets, potatoes, carrots, parsnips and turnips; to vegetable crops, beans, peas, alfalfa, lupines; to grasses and clovers; to onions, flax, kale, cabbages, lettuce, tomatoes, celery, cauliflower and fruits. It clarifies the relationship of manures, compost and chemicals as fertilizers and points out how chemicals should be used to obtain the best results. Its philosophical soundness and logic should do much to avert the confusion of thought introduced by the advocates of compost and manure as against the use of chemical fertilizers **$8.50**

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AACCO Completes Negotiations for Buhner Purchase

SEYMOUR, IND.—The American Agricultural Chemical Co. has completed negotiations in the purchase of the 68-year-old Buhner Fertilizer Co. here. The Buhner firm, founded in 1889 by John R. Buhner, was one of the pioneers in the fertilizer industry. The sale price was not disclosed.

The new owner has already started operations at the three Buhner plants located at Seymour, Ind., Danville and Havana, Ill.

W. J. Turbeville, Jr., vice president, fertilizer sales, for the A.A.C. company, said most of the Buhner personnel have elected to join the A.A.C. company.

With the acquisition of the Buhner plants, the A.A.C. company has enlarged its operations to include 31 fertilizer plants and sales offices in the U.S., Canada and Cuba. The company has been in the fertilizer business for over 85 years. It has other Midwest plants at Fulton and National Stock Yards, Ill.; Cincinnati and Cairo, Ohio; and Detroit, Mich.

The present fertilizer plant at Seymour was built after a fire in 1929. The Danville works was opened in 1949 and the Havana plant, a warehouse for bulk and bagged fertilizer, was opened in 1955.

AIRPORT PROPOSED

MARYSVILLE, CAL.—The possibility of constructing an airport for use by agricultral aircraft is under discussion by the Sutter County board of supervisors. One means of financing such airports in the county would be through tax on gasoline used by the aircraft, but the revenue is not sufficient as yet. The increasing use of aircraft in the county has precipitated demand for action by the county group.

Davidson-Kennedy Appoints Two

ATLANTA—Davidson-Kennedy Associates Co., designers and constructors of chemical process plants, has announced the appointment of A. T. Sieron as project manager and Oliver J. Bolduc as chief process engineer.

Mr. Sieron, a chemical engineer graduate of Notre Dame University, previously was with the New Jersey Zinc Co., General Chemical Co., Calco Chemical Division of American Cyanamid Co. and the Columbia Malting Co. In his new assignment with Davidson-Kennedy Associates Co. he will function as project manager and will also act as consultant on special plant layout problems.

After graduation from the University of Illinois, Mr. Bolduc was with Armour and Co., Keystone Aniline and Chemical Co. and the Chemical Plants Division of Blaw-Knox Co. In his new duties with D-K-A Mr. Bolduc will be responsible for the activities of the process engineering dept.

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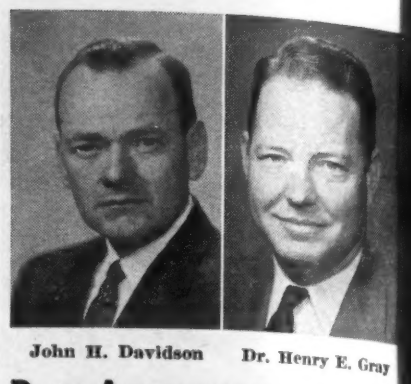


John H. Davidson Dr. Henry E. Gray

Dow Announces New Assignments

MIDLAND, MICH.—Two members of the agricultural chemical development staff of the Dow Chemical Co. have been assigned to new positions at the company headquarters in Midland.

John H. Davidson, 21-year veteran with Dow, has transferred from the field research group at South Haven, Mich., to handle special projects, reporting directly to Dr. Keith C. Barrons, ACD manager. Dr. Henry E. Gray, field specialist who has been working out of the Washington, D.C., office in a 13-state territory, also has transferred to Midland as a project leader.

Mr. Davidson has been closely associated with the field experimental work connected with a number of Dow agricultural chemical products. For the past three years he has been dividing his time between field research plot work and ACD work involving cooperative tests with experiment stations in the Lake States area. He received his training in horticulture and plant biochemistry at Michigan State University.

Dr. Gray's activities in the east were concerned with fumigants, soil fumigants, fungicides and insecticides. In his new Midland assignment he succeeds Dr. O. H. Hammer as project leader for insecticides and space, commodity, grain and spot fumigants. Mr. Hammer now heads the recently organized Plant Science section in agricultural chemical research.

Dr. Gray joined Dow in 1954, assuming the Washington post. He was previously an instructor with the biological science department, California State Polytechnic College, and a research entomologist with the Niagara Chemical Division, Food Machinery and Chemical Corp.

Thimet Approved for Alfalfa Aphid Control

NEW YORK—American Cyanamid Co. has announced that the U.S. Food and Drug Administration has approved the use of Thimet for protection against the spotted alfalfa aphid. Notice of government approval appeared last July in the Federal Register.

Thimet is applied to alfalfa seed by processors using special seed treating machines. After planting the seed germinates and the insecticide enters the sap stream and is carried to all parts of the plant.

Thimet protects young alfalfa against the spotted aphid and lasts up to six weeks after which it breaks down in the plant and leaves no residue in storage, the company said. However, as an extra safety measure the U.S. Department of Agriculture requests that an additional 60-day period elapse before livestock are permitted to graze on the treated alfalfa.

A spokesman for American Cyanamid says cost of treating alfalfa seed with Thimet amounts to approximately three dollars per acre.

DEALER MEETINGS

PORTLAND, ORE.—Fertilizer dealer meetings, sponsored by the Pacific Northwest Plant Food Assn., will be held Oct. 31 at Elmer's Cafe in Moses Lake, Wash. and Nov. 1 at the Washington State College experiment station in Prosser.

Special Merchandising Section

Better Selling

Marketing News and Features

Traps to Avoid In Small Business Management

By A. M. Woodruff
Director, Bureau of Business Research, University of Pittsburgh

Introduction

Good times can be perilous—at least as far as business operation goes. Why? The reason is that in periods of prosperity some executives tend to become complacent. They overlook various dangerous management traps which are always ready to ensnare the unsuspecting. The dangers are greatest in small business. This fact is borne out by recent investigations.

For example, during the 2-year period, 1954-56, the Bureau of Business Research of the University of Pittsburgh studied causes of bankruptcy in the field of small manufacturing. Ten companies which had failed were checked in comparison with 10 concerns which had been highly successful in similar lines. The findings of this study are presented in the following sections. All the bankrupt firms were in lines in which the successful companies, otherwise comparable, made money—at the same time and in the same metropolitan area.

The failures fell into 18 specific and avoidable management traps which the successful firms had avoided. All of the bankruptcies stemmed from poor business management.

Three kinds of poor management showed up repeatedly: (1) poor financial planning because of inadequate records, (2) poor sales management including deficient product planning and market analysis, and (3) poor general administration culminating in expenses not covered by revenues. For a quick picture of how the bankrupt companies fared in regard to the various management traps, see figure 1. This material appeared originally in a publication of the Small Business Administration, Washington.

Operating Experience Analyzed

Here, briefly discussed are the 18 management traps which the survey discovered.

(1) **INADEQUATE RECORDS.** Company A bid unsuccessfully on about 75 government contracts. Lacking the data with which to estimate closely, the managers first presented figures "high enough to be safe." Unable to get business this way, they then employed a representative who turned out to be very expensive and who also got the company involved in a disastrous subcontract. A fraction of the money thus wasted would have been sufficient to establish an adequate bookkeeping system. But, like many others, this concern was guilty of false economy in the accounting department.

Company E was a partnership with a good product. Nevertheless, during bankruptcy proceedings the accountants were unable to reconstruct within reasonable time even the simplest form of statement from the tangle they found. Despite the company's up-to-date plant and excellent equipment, office records consisted of masses of unsorted papers jammed into an old-fashioned safe. The firm, incidentally, had a postage meter with a capacity 20 times its average mail.

Company D became involved in a complex problem of depreciation which stemmed from the writeup of certain assets when they were transferred from a predecessor partnership to the Company D. After several years the company was challenged by the government on its depreciation charges. Litigation dragged on for years. Eventually a tax claim of $300,-

(Continued on page 12)

Frequency of 18 Management Traps

(10 Bankrupt Small Manufacturers)

MANAGEMENT TRAPS	COMPANIES A	B	C	D	E	F	G	H	I	J	
A. Poor Financial Planning											10
1. Inadequate Records											9
2. Cumulative Losses											5
3. Neglected Tax Payments											4
4. Expansion Beyond Resources											3
5. Excessive Fixed Costs											3
B. Poor Coordination Between Manufacturing and Selling											10
6. Lack of Product Development											9
7. Lack of Diversification											7
8. Lack of Data on Own Customers											5
9. Contracted Entire Output to Single Buyer											3
10. Lack of Market Research											2
11. Continued Policies of Bankrupt Predecessor											1
12. Legal Problems											1
C. Poor Other General Administration											7
13. Family Factors											3
14. Lack of Administrative Coordination											3
15. One-Man Management											3
16. Lack of Technical Knowledge											2
17. Absentee Management											1
18. Internal Conflict											1

SHOP TALK

OVER THE COUNTER

By Emmet J. Hoffman
Croplife Marketing Editor

Can a farm supply firm publish its own newspaper and make it pay its way as a business builder?

The answer, taken from the experience of one retailer, certainly is "yes," for this company has been publishing a 4-page newspaper twice a month for more than 10 years. The 11,000 rural area people who receive the newspaper free—10,000 of them are rural boxholders—like the paper very much and are frank in saying so.

Th cost of publishing this interesting newspaper is approximately $6,000 a year, including postage, printing and engravings. The owners consider the newspaper a mighty good business builder, and well they might, for the firm does more than two million dollars worth of business annually on fertilizers, farm equipment, feeds and other supplies.

The firm has four route salesmen who visit customers regularly, and another two men specialize on selling farm machinery.

On the firm's 50th anniversary, it published a special issue of the "Trading Post" its newspaper, which contained a history of the company, ads of the products handled and also pictures of the employees, shown in a group.

Route men for the company cover their areas once every two weeks. Many farmers place regular orders for delivery each two weeks, and if they wish to increase or decrease orders, they phone in before delivery date or write.

Usually about two to three of the newspaper's four pages are filled with individual want ads of farmers who have something to sell or trade, or something they wish to buy. There are several hundred such free ads in each issue of the Trading Post. Thus the farmer who reads the issue will usually find one, two or more items in which he is interested.

The free want ads, too, give the route salesmen something to talk about when they visit farmers. They often pick up a number of these free ads every week; sometimes customers bring the ads to the office and some will mail them in.

The ads are placed under separate headings in the Trading Post such as "For Sale," "For Sale or Trade," "Wanted to Buy," "Miscellaneous," "Public Sales," etc., which help the readers in spotting the sections in which they are interested.

The editor of the Trading Post usually uses a picture of rural interest on the front page in each issue, and he gives full details on the project.

Most of the first page of the publication, too, is devoted to short articles about fertilizers, crop management and other items of interest to farmers. In other words, a publication like this helps to get the "educational story" across to farmers in a way which they will remember.

Product Merchandiser

Swift Introduces Floor Merchandiser

CHICAGO—A product unit called the "End-o-Rak" is being introduced by the plant food division of Swift & Co. to the garden supply trade.

The unit is a floor-standing merchandiser, occupying a space 2 ft. by 2 ft., providing 16 ft. of shelf facing and 8 ft. of space for advertising and merchandising messages.

It is so constructed that access to its stocks of "End-o-Pest," "End-o-Weed" and "Instant Vigoro" can be had from all four sides, thus lending itself to a variety of locations including that of an island display. Standing 6 ft. high, the unit's "bin" portion in the base can hold a weight of over 400 lb., company officials said. The base is protected from floor moisture by a heavy layer of paraffin.

What's New...

In Products, Services, Literature

You will find it simple to obtain additional information about the new products, new services and new literature described in this department. Here's all you have to do: (1) Clip out the entire coupon and return address card in the lower outside corner of this page. (2) Circle the number of the item on which you desire more information. Fill in your name, your company's name and your address. (3) Fold the clip-out over double, with the return address portion on the outside. (4) Fasten the two edges together with a staple, cellophane tape or glue, whichever is handiest. (5) Drop in any mail box. That's all you do. We'll pay the postage. You can, of course, use your own envelope or paste the coupon on the back of a government postcard if you prefer.

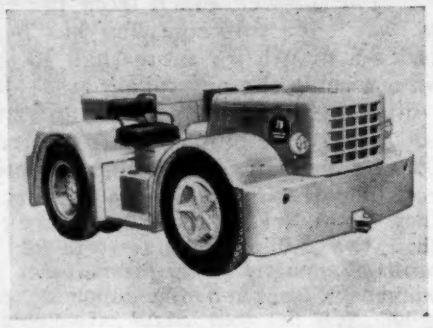
No. 6646—Product Booklet

The family of chemical products for industry and agriculture of the Diamond Alkali Co. is described in the fifth edition of a booklet called "The Story of Diamond Chemicals—Chemicals You Live By." This revised and enlarged, 32-page booklet presents a panoramic picture of these basic materials, their principal applications, and their production.

Fourteen major products or product-groups are discussed in digest form. They are: Soda ash, caustic soda, chlorine, chlorinated methanes, bicarbonate of soda, sodium silicates, calcium carbonates, chromates, specialized chemicals, organic chemicals, plastics, cement, coke and coke by-products, and agricultural chemicals, including lawn and garden chemicals. A copy is available on request. Check No. 6646 on the coupon and mail it to Croplife. Please print name and address.

No. 6647—Towing Tractor

The Frank G. Hough Co. has announced the availability of a new Paymover tractor. The unit, model T-150, develops 15,000 lb. of drawbar effort and features power steering, four-wheel power brakes, power shift-



ed transmission, dual rear tires, planetary-type final drives and a choice of gasoline, or LPG power, company officials state. It has travel speeds up to 22 m.p.h. The tractor is suited for industrial, rail and motor truck terminals and other tractor applications. Head and tail lights are standard equipment. A wide variety of accessory equipment and attachments is also available, including 2-way radio units, aircraft engine starting systems, cabs, snow-plows, sweepers and winches. For detailed specifications or more information check No. 6647 on the coupon and mail it to Croplife.

No. 6645—Liquid Surfactant

A vegetable oil source liquid surfactant, called by the trade name Sole-Onic PGE, is described in a technical bulletin No. 957-1 recently released by the Sole Chemical Corp. Company officials say that two of its uses are as a wetter-sticker adjunct for agricultural sprays, and as an anti-corrosion agent in water-containing aerosols. The bulletin may be secured by checking No. 6645 on the coupon and mailing it to Croplife. Please print name and address.

No. 6648—Insecticide Booklet

A new booklet on the application of Phosdrin insecticide has been prepared by the Shell Chemical Corp. The booklet covers handling precautions, respiratory devices, details for aerial application, symptoms of toxication and first aid treatments, and information for physicians. The importance of following directions right to the letter is emphasized in the booklet. To secure a copy of the booklet without cost, check No. 6648 on the coupon, print the necessary information and mail it to Croplife.

Also Available

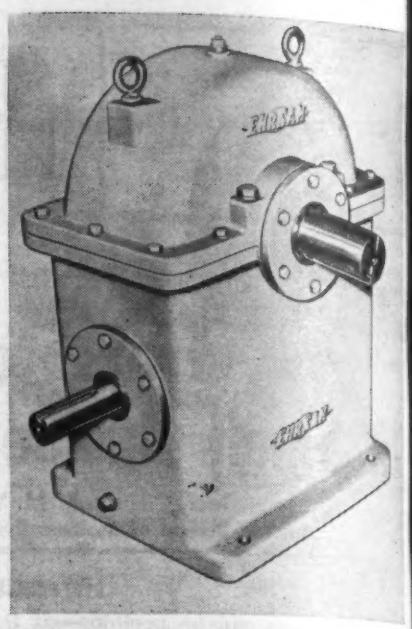
The following items have appeared in the What's New section of recent issues of Croplife. They are reprinted to help keep retail dealers on the regional circulation plan informed of new industry products, literature and services.

No. 6643—Liquid Feed Supplement

U.S. Industrial Chemicals Co., division of National Distillers & Chemical Corp., has announced a new liquid feed supplement for cattle and sheep which the firm believes will be of interest to liquid fertilizer manufacturers and distributors. The product, "Morea," is a liquid mixture containing urea, ethanol, phosphoric acid, essential trace minerals and molasses. U.S.I. said it will sell a concentrated liquid Morea premix to manufacturers who will blend the concentrate with molasses. The firm is currently appointing manufacturers who will mix and distribute the final product to farmers. The company stated that it believes liquid fertilizer manufacturers may have facilities for formulation and distribution of the product. For more details check No. 6643 on the coupon and mail it to this publication.

No. 5823—Speed Reducers

The J. B. Ehrsam & Sons Mfg. Co. has announced complete details of its improved line of speed reducers. The line, known as the Ehrsam style W, incorporates a number of improvements over previous designs, officials said. They are: easier-running bearings, sturdy micrometal housings, and heavy-duty worms and worm gears. The speed reducer is available in nine



standard models or sizes, numbered 3W to 15W. (Model numbers indicate center distance between worm shaft and gear shaft. In model 3W, the distance is 3 in.) All models are available with a wide range of ratios. Weights of these standard models range from 125 lb. for model 3W to 2,950 lb. for model 15W. Complete literature on the line is available. Check No. 5823 on the coupon and mail it to this publication.

No. 5789—Vibratory Feeders

The Eriez Manufacturing Co. announces the production of a new line of Hi-Vi electro-permanent magnetic vibratory feeders which are said to have greater output and move materials faster than units of comparable size. The drive element is completely enclosed. The feeder operates at 3,600 CPM directly off an AC line. An Alnico V lifetime magnet is part of the magnetic rectification system. Action is two-way, push-pull vibration. The company states that all types of materials, "dry, hot, abrasive, lumpy—may be conveyed, agitated, blended, cooled, dried or mixed" in the feeders. Check No. 5789 on the coupon and mail it to secure details.

No. 6640—Urea Ammoniating Solutions

A booklet on urea ammoniating solutions, including detailed unloading and handling instructions, has been issued by the Du Pont Polychemicals Department, manufacturer of "Uramon" ammonia liquors for the fertilizer industry. A chart in the booklet lists the advantages of urea nitrogen as a fertilizer for all crops. Other tables offer information on the characteristics of Du Pont's urea ammoniating solutions. In addition, special graphs report the pound-per-square inch (p. s. i.) pressures generated by the ammoniating solutions at various temperatures, and the temperature rise produced when these solutions are added to fertilizer mixtures. Unloading and handling instructions include schematic drawings of a tank car, and its various valves and connections. A copy of the booklet may be obtained without charge by checking No. 6640 on the coupon and mailing it to Croplife.

No. 6639—TEPP Film

The significance of insecticide formulations incorporating tetraethyl pyrophosphate, commonly referred to as "TEPP" and being produced by many well known insecticide manufacturers, is portrayed in a short motion picture film produced by Eastman Chemical Products, Inc., subsidiary of the Eastman Kodak Co. The company's announcement states: "Considerable attention was given TEPP last year when the new federal controls went into effect regulating the use of toxic chemicals on food crops through the administration of the Miller Act. While extremely toxic when initially applied, TEPP posses-

Send me information on the items marked:

- ☐ No. 5786—Bag Tagger
- ☐ No. 5789—Feeders
- ☐ No. 5822—Dust Collector
- ☐ No. 5823—Speed Reducer
- ☐ No. 6636—Parts Catalog
- ☐ No. 6637—Vacuum Cleaner
- ☐ No. 6638—Dust Collector
- ☐ No. 6639—TEPP Film
- ☐ No. 6640—Urea
- ☐ No. 6641—Calculator
- ☐ No. 6642—Drive
- ☐ No. 6643 Supplement
- ☐ No. 6644—Equipment
- ☐ No. 6645—Surfactant
- ☐ No. 6646—Booklet
- ☐ No. 6647—Tractor
- ☐ No. 6648—Insecticide

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COMPANY .....

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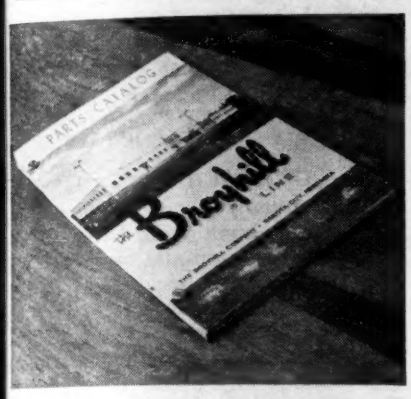
ses the unique property of decomposing into a harmless residue within 48 hours after application. This feature makes it particularly valuable in protecting crops virtually up to harvest time when the use of other insecticides would be unsafe owing to their longer residual effects." The film was originally produced in 1956, and subsequently withdrawn for revisions. The new version shows how the formulations combat insect pests along with approved methods of application. To secure details about securing the film check No. 6639 on the coupon and mail it to Croplife.

No. 6636—Parts Catalog

A new 134-page parts catalog listing 1,306 parts has been printed by the Broyhill Co. Fully illustrated, the catalog has a complete parts breakdown and prices on sprayer and fertilizer replacement parts and accessories for all makes of equipment. The catalog states that the company "maintains one of the largest parts



inventories in the country and can provide fast efficient service from a centrally located source." The catalog is free to companies requesting it by checking No. 6636 on the coupon and sending it to Croplife.

No. 6638—Dust Collector

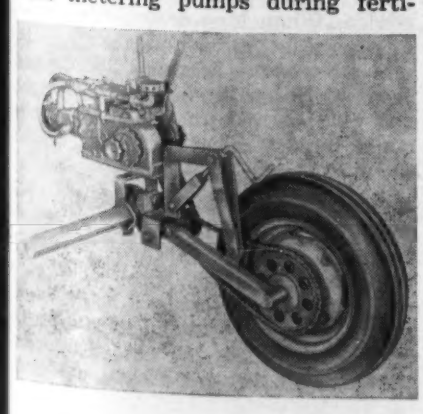
Literature concerning the use of the "Wheelabrator Dustube" dust collectors has been published by the Wheelabrator Corp. Some of the typical installations of the collectors outlined in the literature are: Controlling dust from manual unloading of product dryers; salvage material being lost at pulverizing and weighing stations and through the atmosphere; and to collect dust which creates a hazard to health, housekeeping and equipment maintenance. Secure details by checking No. 6638 on the coupon and mailing it to Croplife.

No. 6637—Vacuum Cleaner

The Hild Floor Machine Co. has introduced a new 15-gal. vacuum cleaner with a special intake that can be used with 1½-, 2- and 3-in. hoses, for light general vacuuming through heavy duty vacuuming. The motor can be detached for use as a portable blower, sprayer or "Strap-Bak-Vacuum." For complete information check No. 6637 on the coupon and mail it to Croplife.

No. 6642—Ground Wheel Drive

A drive wheel unit for operating anhydrous ammonia and liquid solutions metering pumps during fertilizer application has been announced by the Dempster Mill Manufacturing Co. The unit, which can be attached by a single clamp to either a 2-in. or 2¼-in. tool bar, eliminates adapting pump brackets and drive mechanism to control the liquid fertilizer application from the tractor. The unit can be mounted either to the rear or in front of the square bar and is quickly interchangeable from one tractor to another, it is claimed. The wheel is equipped with Timken bearings and roller chain sprockets. Dempster also markets Liquijector liquid fertilizer applicators and pumps for anhydrous ammonia or solutions. Secure details by checking No. 6642 on the coupon and mailing it to Croplife.



No. 5786—Bag Tagger-Coder

Information concerning the bag tagger-coder furnished by the Mill Engineering Co. will be sent without charge to those interested. The coder attachment now available will apply a code to the tag as it is automatically injected into the sewing machine. The code can be changed in less than one minute by use of a special quick change feature, according to the company. "Considerable other information can be printed," the announcement states. The identification of pellets and crumbles can also be made. The inking roll is protected from dust and an air motor is used to eliminate electrical hazards. Check No. 5786 on the coupon and mail it to secure details.

No. 5822—Dust Collector

A special, extra storage capacity dust collector, "Dustkop model 520-D," is the latest addition to the Aget Manufacturing Co.'s Dustkop line. Ten inches higher than the standard model 520, it has identical air handling characteristics and base

dimensions, but a dust storage bin that is over twice as large. The company recommends it for use in any shop operation where dust volume is unusually large. The base is 18 by 23 in, height 34 in. For detailed information check No. 5822 on the coupon and mail it to this publication.

No. 6644—Liquid Fertilizer Equipment

General Metals, Inc., has published a new condensed catalog on its line of equipment for nitrogen solutions and complete liquid fertilizers. The company makes a line which includes such items as storage tanks and field applicators. The catalog gives brief descriptions of most all items in the line. Tanks of aluminum, steel and stainless steel are made in sizes ranging from 30 gal. to 22,000 gal. of both pressure and non-pressure types. Two wheel trailer applicators are made complete with trailer, tank, booms and pump. Other products described in the catalog are tractor applicators, a 3-point hitch applicator with 100-gal. tank and metering pumps. Secure the catalog by checking No. 6644 on the coupon and mailing it to Croplife. Please print name and address.

No. 6641—Calculator

A new type of calculator has been designed by the Phosphates and Nitrogen Division of the American Cyanamid Co. as an aid in determining quantities of phosphatic materials

to be added when formulating various grades of mixed fertilizers. The calculator can be obtained by fertilizer manufacturers who check No. 6641 on the coupon and mail it to Croplife.

Connecticut Director Cites Advances in Control of Pests

NEW HAVEN, CONN.—Significant advances in the field of entomology are reported by James G. Horsfall, director of the Connecticut Agricultural Experiment Station in a report to Gov. Abraham Ribicoff.

Practical control methods and materials have been found for a number of troublesome insects on ornamental plants: complete information is available in station circulars by John C. Schread. In the field of vegetable production, station researchers tested a wide range of materials to control specific pests of cucumbers, spinach, and corn. R. J. Quinton is continuing work on insects attacking alfalfa.

James B. Kring has found endrin to be effective on potatoes in control of flea beetles resistant to DDT, leafhoppers, aphids and the corn borer. Philip Garman continues his trials of materials useful in control of mites on apple trees to keep orchardists "one jump ahead" of these pests which are resistant to insecticides formerly effective. Dr. Garman is also studying combinations of sprays necessary in orchards, and their effects on quality and yield of fruit.

A report is being prepared by R. L. Beard on a detailed investigation of variation in response of insects to chemicals. This study sheds new light on several aspects of development of resistance to insecticides.

Humidity seems to have an important influence on the gypsy moth. Research by Robert C. Wallis shows that the polyhedral virus so effective in killing gypsy moth larvae is probably present in all larvae, and develops rapidly in high humidity. When humidity is low, the larvae apparently consume increased amounts of foliage, presumably to get water. Defoliation under these conditions may be widespread and severe.

Field tests of fungicides have been continued. During the summer of 1956 the experimental testing of materials for the control of Dutch elm disease continued, but the method of testing was changed. A number of promising treatments were found by Malcolm Corden and they are being evaluated further in the growing season of 1957. Potassium permanganate and a number of agricultural fungicides were tested in July, 1955 on large elm trees already infected with Dutch elm disease. Symptoms of the disease seem to be supressed in a number of cases, but not in all.

New England News Notes

By GUY LIVINGSTON
Croplife Special Correspondent

A special session of the General Assembly at Hartford, Conn. passed a three-point program giving farmers some drouth relief and some tax relief. The three-point program, enacted into law after seven legislative days, was:

1. A two-year property tax exemption on livestock owned by persons whose principal livelihood is farming.

2. A program of eight-year loans up to $5,000 at 1½% interest for farmers who lost at least 40% of their crops in the summer drouth. The loans will come from a $2,000,000 bond issue.

3. A law setting up a commission to study the state's entire tax structure and report it to the 1959 session.

The drouth that parched the state throughout most of the summer left more than $8,000,000 damage in its wake.

Canker Control

Framingham, Mass. became the first town in the state of Massachusetts to treat its maple trees for bleeding canker, Myles Huntington, park commissioner, said. A town appropriation of $1,200 is providing for treatment with chemotherapy. Under Ralph B. Meaney of Sherborn, chemical active substances are introduced into the tissue and sap stream of the tree to prevent or alleviate an internal disease. The treatment is being given to maple trees at Center Common and Bowditch athletic field, which were found to be suffering from bleeding canker.

Sawtimber Damage

Damage to sawtimber in Massachusetts forests by insects, disease and miscellaneous causes is some 60 times the toll of the more spectacular enemy, forest fire, Nathan Tufts, chairman of the Massachusetts Forest Industries Committee, pointed out. The industry chairman totaled the annual sawtimber damage as three million board feet killed by insects; 21 million by disease and six million from miscellaneous causes.

The methods available to foresters to conquer insects and disease outbreaks have multiplied spectacularly in the last decade, Mr. Tufts said. "Chemicals are now available, which when sprayed aerially, will stamp out many leaf eating insects. A better understanding of silvicultural practices and their prompt application to infected timber stands comprise the most effective treatment for the majority of disease outbreaks," he said.

Cranberry Crop

The Massachusetts cranberry crop reached 520,000 barrels, an increase of 68,000 barrels over 1956, the State Cranberry Experiment Station at East Wareham, Mass., said. Dr. Chester E. Cross said the station has been conducting experiments with two types of picking machines. One is a dry harvesting machine that is being tested in water picking. The other machine undergoing tests is a water harvester and it is being tried out for both wet and dry picking.

County Agents

County agents from every section of the U.S. convened in Boston for the 42nd annual convention of the National Association of County Agricultural Agents. It was brought out at the convention that the average county agent has been on the job for more than 20 years and knows every one of the hundreds of farmers in his area by their first names.

What's Been Happening?

This column, a review of news reported in Croplife in recent weeks, is designed to keep retail dealers on the regional circulation plan up to date on industry happenings.

A statistical article by Arnon L. Mehring, sponsored by the National Plant Food Institute, said that non-farm use of fertilizers amounted to about 10% of the total consumed in the U.S. At a conservative average price of $75 a ton, he said, the non-farm market comes to some $187.5 million a year, with some estimates going even higher.

The Western Agricultural Chemicals Assn. held its annual meeting at San Mateo, Cal., scheduling talks on weed control, nematodes, regulatory laws, and a program on what influences farmers to purchase and use pesticides. Ivor Burden, United Chemical Co., Richmond, Cal., was elected president of the group.

A report by USDA indicated that the soil bank is likely to exert a considerable influence on the kinds and numbers of insects in many parts of the country. Grasshoppers, particularly, will find in the reserved acreages, an increased amount of more favorable places for egg laying and a greater variety of desirable food plants. Other insects expected to increase in certain localities were listed as cutworms, wireworms, white grubs, Japanese beetles, European chafer, sod webworms, and corn flea beetles.

Alfred J. Dickinson, formerly vice president of Virginia-Carolina Chemical Corp., Richmond, Va., joined Freeport Sulphur Co. as vice president and sales manager, to succeed the late Roy B. Jones.

Southern Nitrogen Co. named Dallas Cantwell as general sales manager and F. R. MacCauley, controller.

Wilson & Geo. Meyer & Co. broke ground for a new office building and warehouse in Los Angeles. The new structure, when completed, will also house the Wilson Meyer Co., and other offices.

Talks by a banker, an educator, a fertilizer technologist and representatives from two other associations were featured at the eighth annual convention of the Pacific Northwest Plant Food Assn. in October. Some 250 fertilizer industry men were on hand at the meeting which was held at the Challenger Inn, Sun Valley, Idaho.

The California Ammonia Co. broke ground for its new 100-ton-a-day anhydrous ammonia plant, Oct. 12. The plant will cost about $4.8 million and construction is expected to be completed in October, 1958.

Three more states, Arkansas, Kentucky, and Mississippi, were added to the list of quarantined states because of the presence of the soybean cyst nematode.

The Shell Chemical Corp. nematode workship at St. Louis, brought out the fact that nematodes cause "many millions of dollars" loss to crops each year. Some 200 agriculturalists heard a panel of USDA and university scientists discuss control of these soil pests in the one-day meeting.

Irrigated croplands need a high rate of fertilization to get optimum returns from the added investment, the USDA stated. "Before a farmer invests in supplemental irrigation, he should be willing and able to use high rates of fertilizer," the department said.

The Beltwide Cotton Mechanization Conference held at Shreveport, La., was told that cotton growers should pay more attention to the amount and type of fertilizer they use. George E. Smith, University of Missouri soils expert, said that except for the cost of the fertilizer, it costs litlte more to bring a two-bale crop to harvest than one which produces only 300 lb. of lint.

Merck & Co. announced a reduced price on its product "Gibrel", a giberellin product. The price went from $10 a gram to $4 a gram. Improvements in the manufacturing process and increased demand were given as reasons for the price change.

G. D. Baerman was promoted to manager of the insecticide products department by Olin Mathieson Chemical Corp. He was formerly manager of field sales in the same department.

Ezra Taft Benson, secretary of agriculture, is prepared to go before Congress next January to ask for an end of corn acreage allotment controls and for a reduction in the level of price supports for corn and the other basic crops—wheat, cotton, rice, peanuts and tobacco. It is expected that Mr. Benson's basis for the proposal will be that corn acreage controls have demonstrated their ineffectiveness and should be ended. To a lesser degree he feels the same is true of other crops.

The Tennessee Valley Authority reports that it produced about 266,000 tons of nitrogen and phosphate fertilizers during the 1957 fiscal year.

Treatment of crops and farm land with agricultural chemicals, especially by air, will probably increase rapidly in the next few years, continuing a trend that began at the end of World War II, the U.S. Department of Agriculture said in a special statement.

Sales and services rendered by aerial applicators topped $90 million in 1956, the National Aviation Trades Assn. reported recently. The applicators stated that they needed a number of additional potent chemical products to do a more complete job, and called on the industry to continue its efforts to provide such materials.

A ten year progress report on the battle against tsetse fly in Uganda, Africa, indicated that the pest has been beaten back so that only 700 square miles are now infested, as compared to some 8,200 square miles a decade ago. Use of insecticides along river banks, plus cultural improvements, have been prime factors in the program.

American Cyanamid Co. established regional offices in Chicago, Dallas, Los Angeles, and New York City for the sales management of all Farm and Home Division products. This division produces and markets a full line of products for "virtually every aspect of the agricultural industry," according to Burton F. Bowman, division director of marketing.

MANAGEMENT TRAPS TO AVOID

(Continued from page 9)

000 was affirmed and the company had to liquidate to meet it.

(2) CUMULATIVE LOSSES. In several cases, serious losses were traced to a series of seemingly insignificant little leaks. Collectively these dribbles were the equivalent of a substantial breach in the financial dike. Management was unaware of the leaks at the time. Suitable reports were either missing, or too cumbersome for analysis, or too long delayed in reaching the proper desk.

(3) TAX REQUIREMENTS. Company J, with yearly sales of about $400,000, was managed by technical men without administrative experience. These men were unconcerned about tax requirements, and took no interest in the tax aspects of depreciation. Annual reports, to be sure, were worked out for income tax purposes, but analysis was limited to a monthly glance at the bank statement. This firm was low bidder on a very substantial contract, but in figuring its bid omitted social security and unemployment taxes. Since no provision was made to pay these taxes they became delinquent, with the inevitably unfortunate consequences.

Similarly, Company H became involved in an equally complex problem of LIFO (last in, first out) valuation of inventory. A mistake by an accountant who had not fully understood the rules led to a tax claim against the company of nearly $450,000. In both cases, decisions on complicated tax problems should have been made only on the basis of the best legal and accounting advice obtainable.

(4) GROWTH INFLUENCES. In most of the cases studied, trouble resulted from the growth of the business beyond the scope of a bookkeeping system which had been used while the firm was small. In three cases, management deliberately tried to save money on record keeping. In another, the owner was unaware of any problems until events forcibly directed his attention to them; by then it was too late.

(5) COST ANALYSIS. Company A did not know the cost of its own plant and tools. The plant was partly built by shop employees. These men, when not otherwise busy, laid cement blocks and did other structural work. Production tools were developed in much the same way. Management contended that the "plant and tools had not cost anything" since they had been built in the spare time of manufacturing employees. This resulted in classifying as expense, items which should have been capitalized. At tax time these cost items were challenged. In the absence of cost figures, an appraiser had to be retained to evaluate the actual capital assets for depreciation purposes.

Company G had three operating departments. Two had skimpy cost data and the other had reports far too elaborate and cumbersome for ready analysis. Management was equally ignorant of costs in all three cases. It later was learned that one department had six identical operations—all of which, to be sure, were necessary. However, two cost about $10 per unit, two nearly $25, with the other two in between. Such facts were in the cost reports but very hard to find. After reorganization and the installation of simple records throughout, the steady loss was turned into a healthy profit, largely by bringing the cost of the six operations mentioned down to the $10 to $12 range.

(6) PRODUCT DEVELOPMENT. Late in the 1920's, Company B ran into mounting sales resistance to its line of wooden ice boxes in competition with steel ice chests. The owner, however, refused to believe that any device for storing food would ever seriously rival his "time tested line."

By the early 1930's, sales of wooden chests had dwindled to the vanishing point. Also, mechanical refrigeration had been successfully developed and was rapidly taking over the market. Some move obviously had to be made. The owner of the firm, with no market study, ordered conversion from the wooden ice chests to steel ice chests. In doing so he shifted operations from one obsolete product which his firm understood to another outdated product which his firm did not understand. When this changeover to steel chests took all remaining capital in the firm plus the owner's entire personal resources, bankruptcy followed.

(7) PRODUCT DIVERSIFICATION. All the unsuccessful companies lacked product diversification. Nine of them engaged in no product research at all. In contrast, however, nine of the 10 successful firms also surveyed emphasized product development as a means of having on hand ready alternatives in case of market trouble with any one product. These successful manufacturers emphasized the importance of "keeping several balls in the air at once."

(8) CUSTOMER INFORMATION. When Company I became badly delinquent on a bank loan, the bank insisted on a systematic review of the books by a local accountant. In the mass of confused data he unearthed an important source of trouble. Company I had been shipping to customers without any credit investigation. Its receivables were in bad shape. There was no systematic collection policy and most of the accounts were 90 or more days old. One customer, for example, owing $4,748, was himself bankrupt and had made no payments for over a year. Yet Company I had continued to ship to him, and carried his account as a good receivable.

(9) MARKET DIVERSIFICATION. In order to avoid the problems of selling, Company A contracted all its output to one buyer. When the buyer cancelled the contract the company was left with no alternatives. And all of its capital was tied up in that particular venture. Company I was caught in a single contract arrangement which it could not fulfill. In the end, however, it was more fortunate than Company A, and was able to reorganize as a more diversified enterprise.

(10) MARKETING RESEARCH. Two companies undertook substantial ventures without any marketing research whatever. Three companies in order to sidestep sales problems adopted the seemingly easy solution of contracting the entire plant output to a single buyer. Later they found that this created very real hazards.

(11) FALSE CONFIDENCE. Company D took over the assets of a bankrupt predecessor, but continued all the same policies. Moreover, it engaged in a substantial tool-up, costing nearly $1 million, with no valid basis for believing that the expansion would be supported by sales. The new management, just like the old, was never able to get its sales up even to the point of profitable operation.

(12) LEGAL PROBLEMS. Company H tried to save money on legal advice. When long-drawn out patent infringement proceedings had to be undertaken, the firm was ill-equipped technically and financially. Foresight and competent professional guidance could have warded off much of the trouble.

(13) FAMILY FACTORS. There were three cases in which favoritism to members of the family contributed to eventual failure. Typically, company assets were depleted in order to carry idle and useless executives at high salaries. In one case, however, the owner's brother-in-law meddled

much in the active management hat disaster resulted.

(14) **ADMINISTRATIVE COORDINATION.** Seven of the 10 unsuccessful firms were never able to coordinate selling and manufacturing. This was partly a by-product of poor records which denied management essential information about which lines were selling and how profitably. And partly it was the result of the fact that the managers frankly loathed selling, and resented the time they felt it "stole from the productive side of the business."

In contrast, the successful firms also studied, kept their selling and manufacturing activities closely coordinated. In nine of these cases, the owner or president kept close watch on sales as well as on production records. In the tenth case the owner was a technical man who did not enjoy selling but fully appreciated its importance. As a result, he hired the best sales manager available and paid him a larger salary than his own.

Trouble was also found in several concerns with regard to formulating policy and communicating it to those who must carry it out. Company I was typical: Its owner was a skilled machinist who did well with 12 machines and 20 men while his wife kept the books. But he fell victim to his own success when he expanded to 60 machines and 100 men. Then he was too busy avoiding technical errors in production to be aware of any problem in coordinating over-all administration. His firm, too, sank into bankruptcy.

(15) **MANAGEMENT SUCCESSION.** One-man management destroyed Company C. The owner built up the firm from its start in a basement workshop to a value of $220,000 in less than five years. Failing health forced his retirement while he was still less than 50 years of age. He sold out to a group of investors who did not realize that his technical genius had been the sole foundation of the company's success. It was never clearly recognized that one man's engineering skill is no substitute in business for a sound management team. When the plant failed six months later the new owners suffered complete loss.

Company D was headed for seven years by a man described by his associates as stubborn, self-opinionated and highly secretive. He kept large sums of company money in his office safe to avoid their disclosure to one of his key directors who was president of the depository bank. When this company head died unexpectedly his associates succeeded to a legacy of indescribable confusion with no prepared successor to the top job.

(16) **TECHNICAL KNOWLEDGE.** A group of investors bought Company G. The new owners had little technical knowledge and lacked any background for selecting a good technical man as operating vice president. But on the basis of the plant's previous reputation they had no trouble getting a contract to supply gun parts. The first two shipments were rejected outright on the basis of quality. Ultimately, the contract was cancelled. The new owners were bankrupt within six months. The lack of technical competence brought operations to a standstill and served to wreck the firm.

(17) **ABSENTEE MANAGEMENT.** Company B fell into the management trap of executive inattention. After a long period of profitable operation, the firm went through a series of years of absentee management. Financial records, which had never been good, were neglected, and with the owner away constantly, the bookkeeper failed to make several years' tax payments. In the end the firm failed.

(18) **INTERNAL CONFLICT.** In Company E, bankruptcy was directly traceable to a 5-year fight between partners. The trouble centered on the subsidizing of relatives in various sinecures, and allegations of various kinds of scandalous misconduct. At one point, one partner secretly negotiated an exclusive sales contract. Through it, in one year, he quadrupled his commissions although total sales volume was reduced. There was also apparent manipulation of the partners' expense accounts. Yet potentially, the line of business was profitable, and had the partners devoted the time to running their firm that they spent trying to outwit each other, the concern would not have failed.

Implications For Managers

The implications of these experiences for small business executives are clear. To stay competitive managers must manage. This means planning, organizing, coordinating, and controlling—for the firm as a whole, not just for one function like production or sales. It means also thinking ahead to offset potential trouble before it is too late.

QUOTE

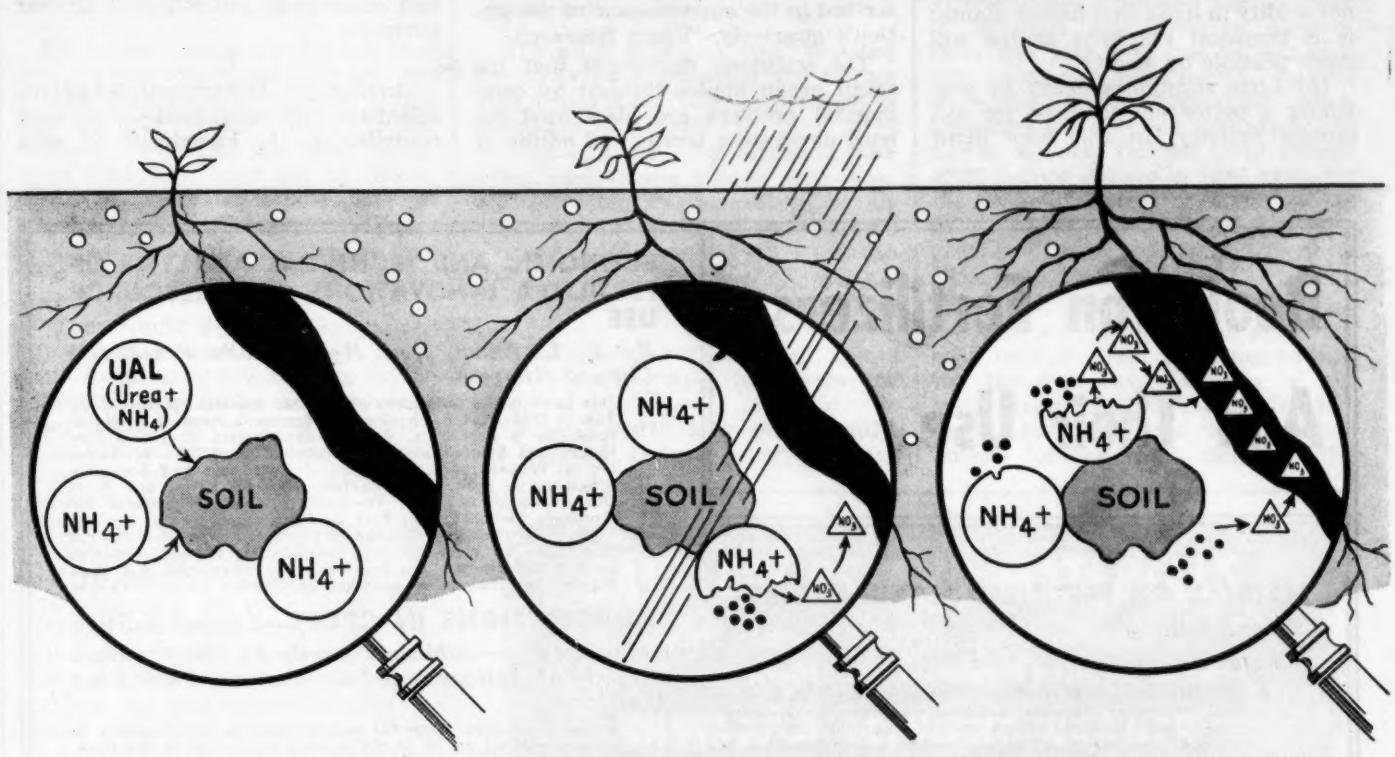
"Fertilizer is an important means of increasing production on farms. This will make the land and the farmer more valuable. When using fertilizer, the farmer gets a direct marketable return within a year, which is faster than the return from almost all other production items. Continued use of fertilizer helps keep farms profitable." — Kenneth P. Brundage, extension farm management specialist, West Virginia University.

Du Pont Announces Garden Chemical Line

NEW YORK—"Shoo fly or die" is the Du Pont Co.'s approach to outdoor insect control for 1958, with a new insect repellent and two new liquid insecticide formulations. These products, along with a new aerosol dressing for tree wounds and a garden hose sprayer, were featured in the Du Pont exhibit at the recent Lawn, Garden and Outdoor Living Division of the National Hardware Show in the New York Coliseum. Du Pont Insect Repellent is the name for the lotion and aerosol formulations, both based on diethyl toluamide.

The new Du Pont Garden Insecticide is a combination of methoxychlor and malathion. It is recommended for use on flowers and ornamentals, vegetables, fruit trees, bushes and vines; around sheds, barns and other buildings, and outside of homes. The other insecticide, being offered in the line for the first time, is Du Pont 72% Chlordane Insecticide, recommended for use on lawns, flowers, shrubs and ornamentals, for control of subterranean termites and for indoor use against household insects.

To its line of garden chemicals this year, the Du Pont Co. has also added a garden hose sprayer which can be used for spraying liquids and certain dry chemicals on lawns, plants, flowers, shrubs, and trees up to 30 feet high.



1. Du Pont UAL provides fertilizer mixtures with urea and ammonium nitrogen. In the soil, urea quickly converts to ammonium nitrogen, which attaches to the soil particles.

2. This ammonium nitrogen resists leaching. Nitrogen is made available to the plants when soil bacteria convert the ammonium nitrogen to nitrate nitrogen.

3. Under normal growing conditions, the conversion of ammonium nitrogen to nitrate nitrogen occurs at about the same rate that growing plants demand this nutrient nitrogen.

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Fertilizers ammoniated with Du Pont UAL have extra sales appeal because they are composed of two highly efficient forms of nitrogen. These forms—urea and ammonium—supply nitrogen that nourishes plants at the rate required for maximum growth and yields.

Nitrogen from Du Pont UAL resists leaching—remains in the root zone where plants readily absorb it. Thus, on the basis of units of nitrogen actually available to plants, UAL is a very economical investment.

Four formulations are available, including UAL 37—a special composition that releases nitrogen even more slowly. For technical assistance and information on the solution best suited to your use, write Du Pont.

Here are other important advantages of Du Pont URAMON® Ammonia Liquors:

- Safe in granulation...no danger of flash fires and less stack. Gives firm, uniform, stable granules, best for storage and application.
- Won't corrode regular fertilizer manufacturing equipment, including ordinary steel and aluminum.
- Gives mixed goods better "feel"—minimizes caking, segregation and dusting.
- Suitable for either batch or continuous mixing.
- Prompt, dependable delivery enables you to schedule your production with confidence.

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FARM SERVICE DATA

Extension Station Reports

In the minds of many farmers and agricultural workers, lime is added to soils to correct acidity so that legumes may be grown. While this is important, it is not the only function of liming, A. C. Richer, Pennsylvania State University soil technologist, observes. Lime increases yields of all crops grown in Pennsylvania.

Corn and other crops are more productive because of liming, says Dr. Richer, for the following reasons:

(1) Lime makes for better sod which provides more organic matter to add to the soil, hence improved structure and fertility.

(2) Lime neutralizes acids but it is not acidity in itself that harms plants; it is chemical reactions in the soil made possible by acidity.

(3) Lime stimulates decay by providing a better environment for microbial activity. In this way plant food is released and nitrification stimulated.

(4) Lime allows the maximum returns from manure or commercial fertilizer applications.

★

The plum curculio has been put to work to further research on pesticides by scientists at Cornell's Experiment Station at Geneva, N.Y.

A method of rearing the insect under laboratory conditions and how its use as a "guinea pig" aids the station investigators in measuring the value of new chemicals introduced by insecticide manufacturers are described in the current issue of the station's quarterly, "Farm Research."

The scientists discovered that the small green apples thinned by commercial growers are ideal food for both developing larvae and adults of the curculio, with a bushel of one-inch apples providing sufficient food for 10,000 larvae, assuming five larvae to an apple. Through the cooperation of research-minded growers, a year's supply of these small apples is placed in storage each season.

By means of an ingenious "trap nest" technic, the scientists are able to keep exact egg-laying records on individual females and determine the lethal dosage of a pesticide required to kill the insect before egg-laying gets well underway.

This method of rearing the plum curculio and testing insecticides is proving highly advantageous. With test insects available throughout the year it is possible to screen far more chemicals than was possible by the old method of field testing. In addition, the method offers several other advantages, chief of which is that the labor involved is a small fraction of that required for field tests. Also, very small quantities of new chemicals, a half ounce or so, are sufficient for test purposes.

★

Connecticut Experiment Station scientists last year made important contributions to knowledge of soils and climate, James G. Horsfall, station director, reported recently.

Tobacco in Connecticut soils shows extremely shallow root growth, making the plant drouth susceptible. Also, nutrient salts are soon leached below the reach of the roots. Studies of this wasteful habit of tobacco, and improved cultural practices, will be reported in a forthcoming bulletin of the station by Henry C. deRoo.

An outstanding accomplishment of the year so far as soil chemistry is concerned has been rewarding study by Tsuneo Tamura, former staff member, of a hitherto unknown clay mineral that gives new information on the difference between two great soil groups in New England.

Verification is needed for preliminary results of an experiment to show how the solids content of potatoes may be influenced by chemical treatment of the plants. The maritime climate of Connecticut, with frequent warm and hazy or cloudy days may in effect result in "shade-grown" potatoes. A remedy to overcome this effect might mean markedly better quality in the crop, says Paul E. Waggoner.

Plant disease warning systems depend in large measure on detailed knowledge as to how spores of the pathogens are dispersed, and when. Field studies in 1956 gave new knowledge of the dispersal of the organisms responsible for tobacco blue mold, cucumber scab, strawberry grey mold and apple scab. A forecasting system is practical, and in use, for two of these diseases, blue mold and apple scab. Dr. Waggoner, Gordon S. Taylor, Saul Rich and Patrick M. Miller are primarily responsible for the station's part in the plant disease warning system.

★

Intelligent land use begins with a study of soil depth, H. W. Higbee, soil scientist for the College of Agriculture at Pennsylvania State University, emphasizes. How deep the soil should be studied depends on how far it extends to bedrock—6 inches, 6 or 8 feet, or perhaps more in some small areas in Pennsylvania.

"Depth is one of the most important characteristics of soil for growing crops," Mr. Higbee explains, "because depth determines a soil's water-holding capacity. Soil moisture, particularly in midsummer, is likely to limit growth even in seasons with more moisture than the one just past."

Not many persons, including farmers, are aware of how much water a growing crop uses. A layer of water about 14 inches deep must enter the soil and pass through the plants to produce a corn crop of 70 bu. to the acre, Mr. Higbee says. Alfalfa, a deeper-rooted plant, requires even more, up to about 25 acre-inches.

About the only way to increase the water-holding capacity of a soil is to add to its organic matter content. This can be done by growing sod crops and plowing them down or by spreading barnyard manure, a slow process in most rotations. It can be speeded up by heavy fertilization of the sod crop, such as often is practiced by vegetable and potato growers, and plowing down the entire grass crop with no harvest of hay.

Not all of the counties of Pennsylvania have been surveyed for soil resources. Mr. Higbee has completed new maps of Fulton, Cumberland, Perry, Mifflin and Juniata counties in recent years. The Snyder County map is being printed.

Maps are also available for the counties of Armstrong, Blair, Bucks, Clearfield, Crawford, Franklin, Greene, Huntingdon, Indiana, Lycoming, Mercer, Montour, Northumberland, Tioga and Wayne. These maps are available on request from M. A. Farrell, director, the Pennsylvania Agricultural Experiment Station, University Park, Pa.

Books on Fertilizers And Their Use

MANUAL ON FERTILIZER MANUFACTURE—Second Edition

Vincent Sauchelli

A complete up-to-date revision of this well known book, that reviews in simple, everyday language the processes of manufacture of superphosphates, of ammoniation, and the formulation and preparation of mixed fertilizers. Indispensable to fertilizer plant supervisors and operators, and a valuable aid to research men and teachers. New chapters added: on plant nutrition, mixed fertilizers, ammoniation, granulation, revised and brought up-to-date. 80 tables of practical information $4.50

SOIL FERTILITY AND FERTILIZERS (1956)

Samuel L. Tisdale and Werner L. Nelson

An advanced college text, for juniors and seniors, following backgrounding course in soils. Covers elements required in plant nutrition, their role in plant growth, and the soil reactions to these nutrients. Several chapters on manufacture, properties and agronomic value of fertilizers and fertilizer materials. Latter part covers soil fertility evaluation and use of fertilizers in sound management program. 430 pages, cloth bound $7.75

PLANT REGULATORS IN AGRICULTURE

Dr. Harold B. Tukey

Published September, 1954. A text book giving background material for county agents, farmers, citrus growers, nurserymen, gardeners; providing fundamentals and general principles; covers encouragement of roots by plant regulators, control of flowering and fruit setting, parthenocarpy, abscission, prevention of preharvest fruit drop, delaying foliation and blossoming, maturing and ripening, inhibition of sprouting and weed control. Brings together specialized knowledge of 17 authorities in the field, with two chapters written by Dr. Tukey, head of department of horticulture at Michigan State College. 269 pages $5.50

THE CARE AND FEEDING OF GARDEN PLANTS

Published jointly by the American Society for Horticultural Science and the National Plant Food Institute.

An entirely new, one-of-a-kind book, it is designed to acquaint readers with nutritional deficiency symptoms or "hunger signs" of common yard and garden plants including lawn grasses, shrubs, flowers, garden vegetables, and cane and tree fruits. It stresses plant "feeding," or "what makes plants grow." Sixteen of the nation's leading horticultural authorities collaborated in its preparation. Cloth bound, 300 pages of text and illustrations including 37 pages in full color $3.00

PHOSPHATES IN AGRICULTURE

Dr. Vincent Sauchelli

A valuable book for the fertilizer salesman, agricultural teacher, farmer, fertilizer agent and county agent. Deals with rock phosphate versus superphosphate and colloidal phosphate, with the origin of phosphorus, the mining and processing of the phosphate rock, granulation of superphosphates, fixation of phosphates in the soil, losses of phosphorus and replenishments, phosphorus in nutrition, radioactive phosphorus, basic slag, fused and sintered phosphates and TVA research data on phosphates from field tests in 13 states. 176 pages and well illustrated $2.75

ECONOMIC AND TECHNICAL ANALYSIS OF FERTILIZER INNOVATIONS AND RESOURCE USE

By E. L. Baum, Earl Heady, John Pesek and Clifford Hildreth.

This book is the outgrowth of seminar sessions sponsored by TVA in 1956. Part I—Physical and Economic Aspects of Water Solubility in Fertilizers. Part II—Examination of Liquid Fertilizers and Related Marketing Problem. Part III— Methodological Procedures in the Study of Agronomic and Economic Efficiency in Rate of Application, Nutrient Ratios and Farm Use of Fertilizers. Part IV—Farm Planning Procedures for Optimum Resource Use. Part V—Agricultural Policy Implications of Technological Change. It presents new methodological techniques for more efficient handling of research problems related to fertilizers and provides more meaningful answers to problems of practical application $4.50

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Doing Business With

Oscar & Pat

By AL P. NELSON
Croplife Special Writer

A tall, lanky man, with blue shirt and khaki pants too big for him, came purposefully into the Schoenfeld & McGillicuddy Farm Supplies store. His black hair looked as if it had needed cutting six weeks ago, and there was an intense look in his burning black eyes. In fact, the sight of the strange fellow startled plump, ulcerish Tillie Mason, the bookkeeper. She looked fearfully at the fellow, was relieved when she saw him heading for the office, where baldish, rotund Oscar was figuring discounts and Pat McGillicuddy was phoning.

Even Ann Hydrous, the Maltese cat, sensed a strange presence. From atop her perch on the safe, she opened her eyes and arched her back as if she didn't know what to expect.

The lanky man rested his gaunt hands on the railing of the office. "You ought to be ashamed to sell that poison!" he hissed. "Your souls must be black as hell!"

Oscar swung around and coldly eyed the newcomer. There was a puzzled expression on his face as he gazed at the burning glare of the newcomer. "Ach, what is the matter with you?" he snapped irritably. "What poison are we selling to make us ashamed once?"

"Chemical fertilizer!" bellowed the lanky man. "And insecticides! They are poisoning the human race—and all for profit! I don't believe in them. I'm an organic farmer!"

"Ach, what's that?" Oscar asked suspiciously. "A farmer that don't pay his bills? We got lots of them."

"I pay my bills, mister, but I wouldn't buy any chemical fertilizer or sprays! Plants don't need them when you farm the organic way. Lots of composting, lots of humus, mulching, working with natural processes—that's all the soil needs. Manure, too. I'll bet you fellows don't know what that is anymore. Dry chemical fertilizer is all you care about—and that anhydrous gas you shoot into the soil and poison it with. Bah—all that is adulterated, Babylonian filth!"

Oscar blinked, then paled. His fists clenched. "Ach, you quit swearing at me, you scarecrow, or I will throw you out by the pants first! We are not ashamed of selling anything we got. It's all goot schtuff. You must have got out the bed the wrong side this morning. Or maybe you ate too much sauerkraut."

"I would not eat that preserved poison!" cried the lanky fellow. "The Ezra Thorndykes have always been organic farmers and eat only natural foods. The sauerkraut you get nowadays—it's embalmed!"

Oscar swallowed hard. "Now don't you run down sauerkraut. By golly, I like it. It makes me feel strong. Maybe you should have a glass of sauerkraut juice every morning. It would clean some of that craziness out of you. You're so schmart. Tell me, why is people living 20 years longer today than they did many years ago?"

The lanky stranger sneered. "You tell me. You can't."

"It's because they get better food," Oscar shouted, his chin thrust out. "Ach, it is food that is growed by fertilizer—dry fertilizer, you dumbkopf. If fertilizer is so bad why is people living longer? If it is bad, they should all be dead!"

"They would live longer if they ate only foods grown with manure and natural fertilizer," said the lanky man, pointing his finger at Oscar.

Oscar swung at the finger, brushing it away. "Don't you point at me!" he snapped. "I won't standt for it. Why is cows giving more milk today than 20 years ago? Why is chickens layin' twice as many eggs as they did 50 years ago? Why is hogs going to market today, meatier and quicker than they did 20 years ago if the food they eat is no goot—all poisoned? That food, as anyone knows, is raised with dry fertilizer and anhydrous, too. If it is no goot, why do people get big and strong on the food?"

"Hurrah for you, Oscar!" cried Pat McGillicuddy, who was through telephoning now and listening to the argument with great relish. Even Ann Hydrous looked interested.

But Oscar apparently did not hear Pat. He was too wound up. "Ach, the trouble with fellows like you is that you are way behind times," he exclaimed. "What do you want to do, raise food like they did in Moses' time? People would starve today if we didn't have chemical fertilizers and insecticides. Is that better than so many people should die because they don't have enough food?"

"They would live much longer and enjoy better health if they raised their foods naturally and ate them," reiterated the lanky man, shaking from anger. "All you fellows think about is selling stuff and makin' money out of it. You don't care about the public health."

"You don't look so healthy to me, by golly!" Oscar taunted. "You are so darn skinny, I'll bet you could eat lots more meat and some oatmeal and potatoes and fatten up a little. Then you would have some thing on you, like me." And he patted his stomach.

"Talk all you want," sneered the lanky man, "but I am going to go around and talk against your business. I must warn consumers not to buy these poisons which injure their health. Someone must have courage to do this."

"Well," barked Oscar, "be sure you save enough time to work so you can make your own living. We can't stand any more fellows on relief, and that is where you will be if you keep going aroundt shootin' off your mouth like this." He turned to his partner. "Ach, Pat, I am sick of him. You tell him."

"Gladly," Pat said, getting up, a sheet of paper in his hand and walking forward. "Mr. Thorndyke," he said sincerely, "we are not against farmers or anyone else using manure for fertilizer. We are not against their composting, and we are not against natural foods. Whatever gave you that idea?"

The lanky man's eyes narrowed. "You aren't?" he asked suspiciously.

"Why, of course not," Pat said with a smile. "Manure is wonderful fertilizer. Composting is excellent if you want to go to all that work. Angleworms? They do an excellent job aerating the soil." He paused for a moment as he caught sight of Oscar's contorting, purplish face. "But," he continued, "there just isn't enough manure and compost and things like that to do the job. We use more than twenty million tons of plant food every year in this country. So we need something beyond manure and what you call organic fertilizer . . . something good; something approved by the U.S. government."

Pat took a deep breath. "I agree with Oscar, my partner. Men live longer because they have more and better food today and better care and living conditions. Cows, hens and hogs produce more than they ever did, and people eat meat and eggs and drink milk and live longer. Would they do that if animals were fed on foods contaminated by poison?"

"You are just talkin'," cried the lanky man. "It's just wind, all of it."

Pat flushed. "It is not. It is just common sense. Why not look at this booklet carrying a speech by William Goodrich, assistant general counsel for food and drugs, U.S. Department of Health, Education and Welfare, Washington, D.C., on the Rational Use of Chemicals in Food? It will show you how the administration, through its scientists, establishes safe tolerance for the use of chemicals in the growing and use of food. Pay attention to those words 'safe tolerances.'"

"It's all a bunch of lies," shouted the lanky man, pounding the railing with a thin hand. "The government is in cahoots with you!"

"That's enough," Pat exploded. "We have tried to use reason with you. We've treated you as politely as we can and you stand there and insult us time and again and don't even use common sense. I know all organic farmers aren't as narrow minded as you."

"That's what I think, too," Oscar said suddenly. "Ach, he makes me mad!"

"Why, Oscar!" said Pat warmly. He grasped Oscar's pudgy, sweaty hand. "For once we agree!" Both men gazed at each other in astonishment. Then at the sound of a cry and hurrying footsteps they turned to Mr. Thorndyke, but he was gone. He was fleeing down the main aisle, headed for the door, with Tillie Mason chasing him with a hand sprayer raised high in her right hand.

Delaware Cash Farm Income Shows Rise

NEWARK, DEL.—Delaware's gross cash farm income rose from 101 million dollars in 1955 to nearly 113 million dollars in 1956, according to a report made recently by Dr. William E. McDaniel, chairman of the department of agricultural economics at the University of Delaware.

Dr. McDaniel said the 12 million dollar increase was chiefly from the sale of crops. Two-thirds of the advance came from the sale of corn, soybeans and potatoes. The increase in livestock and livestock product sales was less than one million dollars. Gross cash farm receipts in 1956 were the largest since 1951, when Delaware farmers had receipts of 116 million dollars. The net farm income of 31 million dollars in 1956 exceeded the 1955 net income by seven million dollars. This was two million dollars greater than the net farm income in 1951, the economist said.

Net farm income figures for 1957 are not yet available, he said, but cash receipts from farm marketings for the first seven months of the year were 61 million dollars. Dr. McDaniel compared this to 57 million dollars for the same time in 1956.

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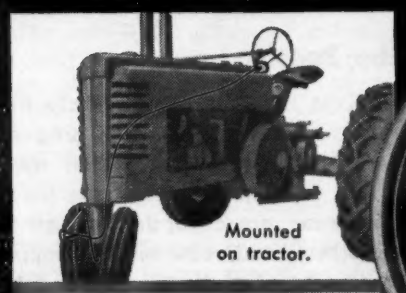

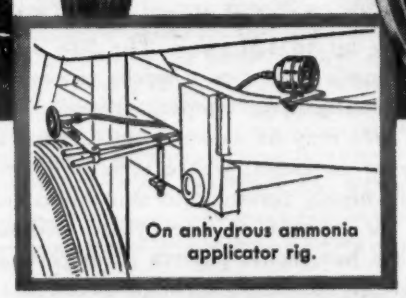

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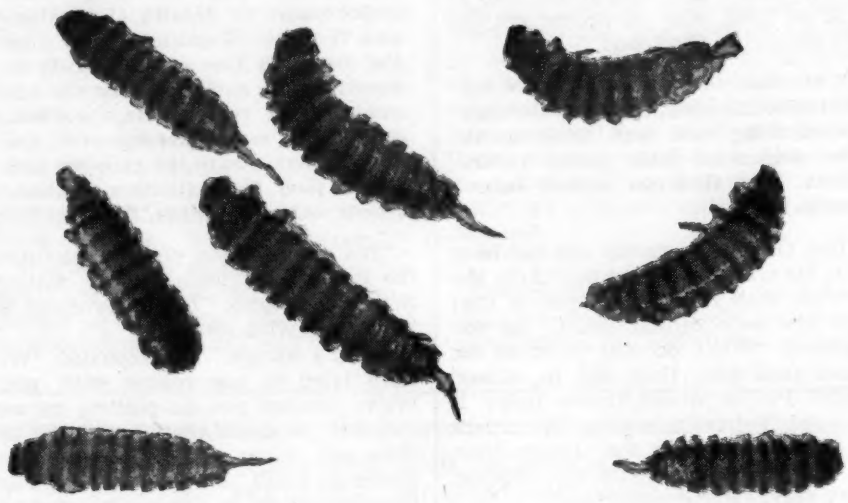

Khapra Beetle

How to Identify

The adult khapra beetles are small (from 1.8 to 3.0 mm. in length), pale red-brown to dark brown or black in color. Although it is hairy on top, the hairs are often rubbed off which gives the adult a slick appearance. The larvae, as shown above, are yellowish brown, clothed with long, brown hairs. The underside of the body is pale yellow and when viewed from above, the arrangement of segments gives the larvae a ringed appearance.

Habits of the Beetle

The pest thrives in areas of relatively high temperatures, with the optimum being between 90° and 99° F., although the upper limit for their development has been placed at 104° F. Larvae cease to develop at 46° but on the other hand, can resist temperatures as low as 14° for short periods. Adult females lay up to 126 eggs. The life cycle varies in length from 4 to 6 weeks to several years, depending upon temperature and food supply. There may be as many as 12 generations a year in India, where it is a native. Larvae are highly resistant to starvation and can live for months or even years without food. It has but feeble powers of migration, so its spread has been through avenues of trade.

Damage Done by Beetle

Stored grain damaged by khapra beetle looks as if it had been infested by the lesser grain borer. Khapra beetles not only live on grain, but they also contaminate grain by leaving quantities of barbed hairs which are said to be a serious menace to humans if swallowed. Khapra beetle damage to stored grain is complete, as illustrated by the example of a California warehouse which despite its efforts to control the beetle, finally wrote off as a total loss, some 300 tons of grain. In addition, the firm abandoned the warehouse for grain storage purposes.

Control of Khapra Beetle

The insect itself is not materially more resistant to fumigants and residual insecticide sprays than are many other stored grain pests. But it is still more difficult to control because of the habit of larvae crowding into spaces in the structure of buildings and bins, where it is almost impossible to reach them with sprays or fumigants. Little success has been achieved so far in eradicating this insect from premises that become infested. The establishment of quarantines to restrict movement of grain between areas where the beetle is known to exist and those thought to be free from the pest is regarded as one means of controlling the spread of the insect. The transportation of infested grain, feed, or seed in railway box cars can result in the wholesale contamination of the rolling stock of the country, with the danger that infestation will spread throughout the country, a representative of the U.S. Department of Agriculture has observed.

Photos of khapra beetle furnished Croplife through courtesy of the U.S. Department of Agriculture.

FERTILIZER CONTROL OFFICIALS

(Continued from page 1)

in the home market place and that they will not be priced wholly out of foreign markets."

Referring to the farm income, he noted that "the decline has been much publicized and the decline in receipts from farm marketings has been substantial. Yet, it is a fact that the total income of those living on farms has been and is increasing." In this connection he noted that "we do not know, but we suspect that a smaller share of non-farm income is available for the purchase of fertilizers than is available from income from farm marketings."

He indicated that the decline in purchasing power in the hands of commercial farmers has reduced fertilizer buying. "This does not appear to be the sole cause of the decline in fertilizer sales. I suggest that other causes may be found in acreage reduction brought about by government programs and by too much or too little rainfall," he said.

Mr. Truitt called for a better selling and educational job on the part of the fertilizer industry "to sell enough fertilizer to bring crop production to its maximum efficiency."

In this connection, Mr. Truitt noted the work being done by NPFI in carrying the message of fertilizer economics to the farmer. He outlined the expansion program which "in two years practically will double our efforts in research and education and, as required, in areas of governmental affairs." He said the new program would be carried out through four or five regional offices with personnel working closely with control officials, experiment stations, extension services and manufacturers. "This program is one which, essentially, will embody research, evaluation, dissemination and the application on the farm of all the practical information which we can develop about proper fertilizer usage," he stated.

In an address captioned "Some Observations in Connection with the Advertising and Sale of Fertilizer," Sigurd Anderson, commissioner, Federal Trade Commission, Washington, stressed the work of the FTC in combatting misleading and fraudulent advertising.

In the address Mr. Anderson called for "clean, honest and decent advertising in American industry" and noted the need for good, conscientious government officials at all levels. He stated that the control officials had a "tremendous job on their hands," and said he was gratified to see the excellent work being done by them.

Mr. Anderson said that cooperation of state control officials and better business bureaus was a tremendous assist to the FTC in its work against false and misleading advertising.

Mr. Anderson stressed the tremendous strides in the growth of the fertilizer industry and declared that the job of the control officials and the FTC to protect buyers against questionable products would become greater and more complex in the future.

An interesting series of colored slides, illustrating work with plant hormones and growth stimulants on plants, vegetables and fruits, was presented by Dr. Paul C. Marth, senior physiologist, U.S. Department of Agriculture, Beltsville, Md.

In connection with rooting chemicals and fungicides in rooting mixtures he recommended that the fungicides and mixtures be kept separate for the present. He further noted evidence of stimulating action in amino acids.

Dr. Marth reviewed work on fruit growth regulators to reduce droppage of fruit from trees, encouragement of ripening of early varieties and reduction of number of fruit on trees. In this connection he reported a new material in the experimental stage for thinning out the number of fruit on trees.

Another interesting series of slides showed work with a sprouting retarder which had preserved potatoes for a full year without any detrimental effect. The chemical has not as yet been approved. Dr. Marth further showed the remarkable effect of dipping green bananas in a solution of 2,4-D which had enhanced ripening and improved the quality of the fruit. He said this had not been cleared yet, but appeared non-toxic and should have a future.

A great many of the slides were devoted to work on flowers with gibberellic acid showing its remarkable growth stimulating effect. Dr. Marth further noted that there are about 100 compounds now known which have the opposite effect of shortening plants or stunting growth.

The proper classification of hormone type growth promotors was touched on by J. D. Patterson, Salem, Ore., in his presidential address. He stated that "a new problem which is beginning to be discussed concerns the place in agriculture of hormone type growth promoters. Although they are growth stimulators, they are not a source of plant food as commonly understood. Neither can they be considered in the field of insecticides. I realize that existing fertilizer laws in many cases can be stretched to include such products. Personally, I do not like enforcement that depends on 'stretch' and it is for that reason that I believe it will be necessary for some type of new legislation to properly define their position in our control work. I believe that our association should be prepared to take a uniform stand when the need for control arises."

In an address on "Commercial Aspects of Minor Elements in Fertilizer," Dr. R. P. Thomas, technical service supervisor, International Minerals & Chemical Corp., Chicago, saw the use of premium fertilizers growing in popularity and demand despite their higher price tags.

He declared that increasing demand is definite because "the industry realizes trace elements are as much a part of fertilizer as N, P and K." He saw the addition of more secondary and minor nutrients in these premium grades possibly leading to more problems. He described the premium fertilizers as "an insurance rather than a cure-all," assuring against temporary shortages.

Dr. Thomas stated that many fertilizer users have low efficiency, and the efficient fertilizer users want premium fertilizers for quality as well as quantity production because they give better fruit, lower harvesting cost, better protein content and disease and insect resistance.

Referring to problems in mixing premium fertilizers Dr. Thomas listed effect on physical condition, influence on bagging time, reaction with hydroscopic salts, the increase in milling procedures and the requirement of premixing.

There are now 53 different branded nitrogen solutions being produced in the U.S., according to a resume of physical and chemical characteristics of such products by Dr. J. Richard Adams, acting head, Fertilizer Supplies and Consumption Trends Section, USDA, Beltsville, Md. From the two original suppliers of nitrogen solutions, E. I. du Pont de Nemours & Co. and Allied Chemical & Dye Corp., the industry has now grown to include 22 processing corporations from 27 producing points, he said.

Four classes of nitrogen solutions were itemized by Dr. Adams: ammonia-ammonium nitrate solutions, ammonia-ammonium nitrate-urea solutions and non-ammoniacal nitrogen solutions. The first three, he said, are produced primarily for mixture with superphosphate, while the fourth class, non-ammoniacal solutions, are for direct application on the soil.

The speaker provided the state control officials with a detailed chart of 53 nitrogen solutions now on the market which fall in the above four classifications. In the ammonia-ammonium nitrate class the advent of ammoniation-granulation of mixed fertilizers has brought on at least four new solutions in the class. This group ranges in ammonia content from 25-34%, in ammonium nitrate from 60-69% and all include 6% water. Three solutions in the class are for direct application and range from 37-41% total nitrogen.

There are 10 different solutions in the ammonia-urea class, he said, with total nitrogen ranging from 21-46% and urea content varying from 32.5% to 43.3%. All of the 11 solutions in the ammonia-ammonium nitrate-urea class are for making mixed fertilizers, while the fourth class, non-ammoniacal solutions, is all for direct use on the soil. One solution in the fourth class containing 83% ammonium nitrate requires a certain heat to keep the product in liquid form, he added, and the other 14 solutions in this class may be handled without any special difficulty to the consumer. Urea has been added to three of the solutions in the non-ammoniacal class without adversely affecting salting-out temperature.

Committee reports by various AAFCO investigators concluded the convention. A status report on the proposed revision in the uniform fertilizer bill which would involve a change from oxide to elemental guarantees for phosphorus and potassium was given by the special fertilizer guarantees investigating committee. They reviewed the opposition to the change which has come from several segments of industry, the cautious attitude on the part of control officials and the fact that the provision failed to be enacted in legislation proposed this year in Iowa and Delaware.

A survey of state experiment station and extension agronomists has indicated an interest in the provision, F. W. Quackenbush, committee investigator said, and it was felt that industry was not well enough informed on facts concerning the subject. Nearly all states reported the change would require legislative action. A suggestion that consideration be given to the labeling of fertilizers in terms of ratios and total units without mention of grades was not deemed fully satisfactory by the committee. It was felt that the agronomists should take a stronger lead in the project if they wish the change to be made.

A status report on methods of sampling bulk fertilizers was given by M. B. Rowe, Richmond, Va. The investigator reported the AAFCO is working with a committee from the National Plant Food Institute on a survey to summarize differences in measurement by various sampling instruments and variation in sampling procedure as to quantity source of the sample. Over 500 determinations have been taken in a three-state test area and as soon as the analysis is completed a report will be prepared for consideration in 1958.

The committee on registration forms presented sample forms to the officials based on recommendations from the committee. The committee urged that these forms be checked with the forms used by the various states with the hope that uniform registration forms can be established in as many states as possible for benefit of both industry and control agencies.

Following the continued demands from industry, and the NPFI in particular as voiced by Mr. Truitt in his talk, the committee on publications and tonnage reports indicated progress in gaining uniformity of reporting procedure among the states. A recommended order of arrangement of tonnage consumption figures by materials and grades was presented to the association. Committee chairman Henry DeSalvo, Little Rock, Ark., said that 34 states out of the 43 answering the committee's survey felt the form could be used and 18 said they would be ready to adopt the uniform procedure by 1958.

The convention concluded with election of officers and presentation of a presidential memorial plaque to retiring president J. D. Patterson of Oregon.

AAFCO OFFICERS

WASHINGTON—J. J. Taylor, Tallahassee, Fla., was elected president of the Association of American Fertilizer Control Officials, at the annual meeting which closed here Oct. 18. Mr. Taylor who is the state control official of Florida, previously was vice president of the group.

New vice president is F. W. Quackenbush, Lafayette, Ind., and Bruce D. Cloaninger, Clemson, S.C., was re-elected secretary-treasurer. Retiring 1957 president, J. D. Patterson, Salem, Ore., and R. C. Wetherell, Bozeman, Mont., join the AAFCO executive committee.

Other executive committee members include the 1958 officers just elected and Stacy B. Randle, New Brunswick, N.J., Charles Marshall, Ottawa, Canada, and Ernest A. Epps, Jr., Baton Rouge, La.

NO NEMATODES

SPRINGFIELD, ILL. — The soybean cyst nematode thus far has not been found in Illinois, according to Stillman J. Stanard, director of the Illinois Department of Agriculture.

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How to Correct Plant Hunger Told by Western Specialist

By Lee Fryer*
Manager, Plant Food Division
Pacific Agro Company,
Seattle, Washington

When hunger signs show in the crop, it is often too late to get a full yield that same year. It is best to diagnose the cause of the trouble, if possible, and then compute the cost of correcting it. Sometimes the cost is too great. For example, last year we were called upon to determine why an orchard of Oregon prunes produced only small red fruit, instead of normal dark blue juicy prunes. Laboratory analysis of the leaves and soil showed that the specific problem was deficiency of both potash and phosphorus, accompanied by lack of enough boron.

The trees were 60 years old, however, and scarred by the ravages of time and malnutrition. The cost of rebuilding the fertility of the soil, without the use of livestock and pasture in the system of farming, was too great. The only logical procedure was to pull out the trees and change the farm enterprise.

English and Western European agronomists and crop students have led the way in learning how to diagnose plant food deficiencies. Their main strength is their emphasis on using many tools of diagnosis, instead of specializing too much in just one tool, such as soil analysis alone, or study of the dry matter in the plant.

Our American style has perhaps been a bit too specialized. We have boron experts, and zinc experts, and phosphate experts, but only a few persons available to the farmer who can go into the field and do a systematic job of diagnosis when the crop gets into trouble.

This paper reviews those procedures which are clearly basic and useful in this interesting field—the recognition of hunger in crops, the diagnosis of the specific causes, and the correction of the problem.

Method No. 1—The Eye of the Student. Observation with the eye is the starting point. If the eye is skilled, and the person is experienced, an accurate diagnosis of plant food problems can often be made simply by inspection of the plant, and especially of the leaves and growing tips. We can list some of the common symptoms:

(1) If the tip and margin of the leaf are brown, we suspect lack of **potash.**
(2) If the leaf is pale between the veins, on lower leaves, we suspect lack of **magnesium.**
(3) If accompanying the interveinal chlososis, there is a muddy olive color to the leaves or a glazed appearance, we may suspect lack of **manganese.** (Except in grasses)
(4) If the leaf lacks color, has a creamy hue, and if these pale leaves are near the top of the plant (on growing shoots), we suspect lack of **iron.**
(5) If the growing shoots are stunted, and if buds are inactive and corky (dead tissue in centers), we suspect lack of **boron.**
(6) If the growing tips are hooked down, and the leaves are narrow, we may suspect lack of **calcium.**
(7) If color is generally poor, or pale, we usually suspect lack of **nitrogen,** but we also may consider lack of **sulphur.**

The loss of color between the veins of lower leaves is a common ailment in Alaskan greenhouse tomatoes and cucumbers. Both plants are susceptible to this problem, and the cause is almost invariably lack of magnesium, caused by imbalance between the magnesium, calcium and potash in the greenhouse soil.

The causes of the visual symptoms of hunger are often evident to us when we learn more about the functions of the plant, and the movement of the plant foods in it. For example, the magnesium deficiency appears first on the lower and older leaves, because the plant can move magnesium from place to place in its tissues. In the face of deficiency, it simply removes some from the older leaves in order to take care of the new leaves nearer the top of the plant. These new leaves require magnesium to make their chlorophyll.

On the other hand, when the plant is deficient in **iron** (and it must have this element also to make chlorophyll) the pale leaves appear at the growing tip, because iron is immobile in the plant, and it cannot rob older leaves to feed the starving new ones.

Factors such as these help the experienced person to look at plants with a capable diagnostic eye.

Method No. 2—Field Tests of Plant Food in the Sap. The theory behind this method of analysis is as follows: When the plant hungers, it lacks a food element that will be low or missing in the sap flowing through the petiole (stem of the leaf) to the leaf blade. By chemical analysis in the field, this low or missing element can be detected. This process takes only a few minutes, and it is obviously a good counter-check on both soil analysis and one's opinion about visual symptoms shown on the leaves or growing tips. (Portable kits are available for making these quick field tests, for nitrogen, phosphorus, potash, and magnesium.)

In our own work in the State of Washington, we supplement these procedures with useful guide tests for checking boron and iron. During the past season we have made over 6,000 field tests for major and secondary elements in the conductive tissues of plants, and the mass of this information has been catalogued in relationship to dry matter tests, soil analyses, and study of visual symptoms of the plants. In this manner, we are finally establishing a better foundation for diagnostic work.

It must be borne in mind that the field examination of the sap in the petiole is only one guide, when we are confronted by a distressed farmer whose crop has stopped growing. If the cause for the trouble is not clearly evident, a dry matter analysis in the laboratory assists field diagnosis, and this brings us to Method No. 3.

Method No. 3—Laboratory Analysis of Dry Matter. When the problem is difficult, or when verification is needed, or when a pattern of hunger signs appears in an entire neighborhood, or affects an extensive and valuable crop, it pays to make numerous laboratory analyses of the dry matter of selected portions of the plants.

As a rule, the leaves are picked carefully from representatives of good and bad specimens of the crop, from selected portions of the plant. For example, on potatoes the leaves might be taken from the fourth branch down from the top on the main stem. The leaves are then baked dry, and the resulting dry matter is chemically analyzed for content of various plant foods, including the secondary and trace elements, as well as the majors.

This method of analysis lends itself to diagnosis of possible trace end secondary element deficiencies, since it yields quantitative data on the presence of all of the plant foods essential to growth of a normal plant and crop. When deficiency of boron, for example, is the cause of the grower's problem, it is almost always evident in the dry matter analysis, and a reading of less than 25 parts per million for many kinds of leaves and crops often gives the key to diagnosis.

Helpful guides are being developed to aid in the interpretation of these laboratory reports. The English work, "Chemical Composition of Plants As An Index of Their Nutritional Status" by Goodall and Gregory, and published by the Imperial Bureau of Horticulture and Plantation Crops, Aberystwyth, Wales, is a good guide in evaluating these data. The text, also, is valuable in giving us better understanding of the various diagnostic procedures.

For many plants, we have to develop our own interpretative guides. We have done this, in part, for the Alaskan potato crop. The dry matter analyses for potash helped in the diagnosis of the so-called Matanuska malady. In the Northwest area, stateside, we have set up the diganostic levels for rhododendrons and azaleas and related plants. We find that chlorosis occurs when manganese exceeds iron, and also in those instances where iron falls below 100 parts per million. We also find a characteristic leaf symptom when phosphorus in the leaf falls below 1,000 parts per million. In Yakima apple and pear trees, we always find boron starvation when the leaves contain less than 20 parts per million of boron.

Method No. 4—Soil Analysis. The soil, being the carrier of nourishment of the plant, provides information as to what it may offer or not offer as a daily fare. Often it is clearly lacking in plant foods. A quantitative chemical analysis reveals this condition. Frequently, such a chemical analysis helps in the diagnosis of a crop production problem.

The soil analysis, among the diagnostic methods, needs the most horsesense in its use, and the most local knowledge and experience in its interpretation. In part, this is true because the soil is itself a complex living material, host for a whole realm of large and small organisms, and a balance of a dozen or fifteen intricate chemical factors.

The absolute amount of any one plant food, for example potash or magnesium, may not be nearly as important as the relative amount of each; both must be measured roughly against calcium, etc. Further to complicate matters, a given amount of plant food in an acid soil might nourish a plant adequately, while twice as much in a high calcium soil of alkaline pH might not be enough. So travail awaits the cock-sure soil analyst.

In our own work, we have finally adopted two separate laboratory procedures for the high lime and the low lime soils; or for those generally from high rainfall and from low rainfall areas. Anterior Alaska and the Matanuska Valley, generally speaking, have soils with low rainfall characteristics, and we are now trying to improve our interpretative guides for these soils.

Method No. 5—Spraying Or Other Forced Feeding Of Specific Nutrients. Often the quickest and most effective way to diagnose an iron deficiency is to spray the plant with iron in a suitable form. Within a day or two, it will tell us whether hunger for this element is the cause for cessation of its normal growth.

In the case of lawn grass, we can frequently photograph the greening effects of an iron spray in one hour, if the plants need iron.

When it was wished to determine whether some potatoes were suffering from a molybdenum deficiency, we mixed sodium molybdate with water and sprayed a marked row of plants. The results were negative, but the method was sound.

Last year, we suspected that the break-down in the Matanuska potato plants was caused by potash starvation in the long photo period of midsummer. Although these soils seem by some tests to be fairly well supplied with potash, it was possible that the soil could not yield the potash fast enough to the plant to support tuber formation during the long summer days. The affected plants showed lack of potash in the petioles, and in the dry matter analysis of the leaves, while at the same time showing a fairly good soil status. Spraying selected rows and fields with a solution of sulphate of potash brought immediate improvement, and the spray method helped to diagnose a very complex crop production problem.

Above are listed the tools of diagnosis. Next comes the question of correction. What shall the farmer do to save his crop? What shall the distressed home gardener do when his roses, sweet peas, or chrysanthemums have pale leaves?

In some cases, diagnosis gives direct guidance to correction. If we are dealing with valuable nursery stock, and a diagnostic spray causes marked improvement, it is logical to spray the whole field. In case of annual crops, the decision may not be

GROUNDBREAKING—Groundbreaking ceremonies were held recently at Lathrop, Cal. for the new $5 million California Ammonia Co. ammonia plant. Shown in the foreground, from left to right, are Lowell W. Berry, Piedmont, Cal., chairman of the board of California Ammonia Co. and president of the Best Fertilizers Co.; Carlos Sousa, San Joaquin County sheriff; J. Earl Coke, vice president of the Bank of America, San Francisco; Bernell Harlan, Woodland, Cal., president of California Ammonia Co., and E. Van Dornick, vice president of Macco Corp., Los Angeles, which has the contract for engineering and erection of the plant. For the story of this new venture see page 1 of the Oct. 14 Croplife.

* From paper delivered at Eighth Alaskan Science Conference, Anchorage, Alaska, Sept. 11, 1957.

so easily made, because the season may be too far advanced. For these crops the yield may be determined in two or three critical weeks that have already gone by. The wise farmer will then plan for correction in next year's crop, instead of the present one. The aim is to produce a profitable increase in the yield; not simply to improve the color of the leaves.

In cases of magnesium deficiency, for quick effect, we spray with Epsom salts or with sulphate of potash-magnesia. For slower effect, and to prevent the magnesium problem, we use the same materials applied to the soil. If still slower effect is acceptable, and a higher pH is desired, we use dolomite applied to the soil.

In cases of major element deficiency, we correct through conventional applications of nitrogen, phosphorus and potash, seeing that moisture is enough to get these materials into solution; or we spray the leaves with suitable forms of these same materials if we desire more rapid correction. When sulphur deficiency is present, we choose major element carriers that contain sulphate, such as sulphate of potash, single superphosphate, or sulphate of ammonia. When we need lime in quickly soluble form, we choose a major element carrier containing lime, such as calcium nitrate, or cyanamid.

Where the trace elements are concerned, we try not only to supply the critical material, but also assure its assimilation by the plant. Much work has been done on this, checking the appearance and growth of plants and their ash content, when they were fed with various trace element formulations and carriers. In our own work we have grown plants for extended periods of time of pH 9.0 with various forms of trace element feeding, in order to check on the efficiency of the carriers of iron, zinc, copper, boron, manganese, and molybdenum.

As a result of this work and of field experience, we generally use the fritted form of trace elements when we make soil applications of iron, zinc, manganese, etc., since this form is non-toxic and is not tied up chemically with other elements as it is fed through the soil and root system.

We use this fritted material to correct boron deficiency, when we have time for a soil application, or to prevent the problem. Soil applications of borax are made less frequently. We also use the fritted material to prevent iron, zinc, manganese, copper and molybdenum deficiencies when soil application is the most economical and practical from the grower's standpoint.

For quick corrective work in dealing with trace plantfood problems, we use spray applications fed through the leaves and bark of the plant. As a rule, we use the lignin sulphonate formulations, since these are quick and effective.

In some cases, we resort to the conventional treatments, such as iron sulphate as a spray or soil fertilizer, or zinc sulphate, borax, sodium molybdate, manganese sulphate, etc.

We learn, as time goes on, to favor the "shot-gun" applications of trace elements to correct the problems in the micro-nutrient field. The interaction between these micro-elements, and between each of them and the major and secondary plantfoods, is so intricate that the most practical approach is to provide compiete nutrition, letting the plant decide in "cafeteria style" what to consume.

In the "shot-gun" approach, a small but adequate amount of each essential plantfood is provided either in the soil fertilizer or the spray. The additional cost is usually from $5 to $10 per acre of crop. If the crop is valuable, and if a nutritional problem is prevented, this added cost becomes an excellent investment.

Frederic M. Smith

PROMOTED — Paul C. Williams, president of O. M. Scott & Sons, Marysville, Ohio, announces the election of Frederic M. Smith as vice president. Mr. Smith has been manager of the eastern division of the firm since 1935, and director of its Cranbury, N.J. turf research center. Before joining Scotts he was active in lawn building and landscape planting on Long Island. Mr. Smith will continue to reside in Plainsboro, N.J.

Arkansas Fertilizer School Scheduled

LITTLE ROCK—The seventh annual Arkansas Fertilizer School will be held Nov. 21-22 at the Marion Hotel here under the sponsorship of the University of Arkansas in cooperation with the Arkansas Plant Food Educational Society.

The sessions will get underway the evening of Nov. 21 with a board meeting of the society. Woody N. Miley and Donald Adams, University of Arkansas, will report on results of fertilizer demonstrations, and Dr. R. L. Beacher, University of Arkansas, will talk about fertilizer ratios.

C. A. Vines, associate director, Agricultural Extension Service, will extend greetings to open the meeting on the last day of the school.

Other speakers and their topics include: Dr. D. A. Brown, associate agronomist, "Liquid Fertilizer"; Dr. Beacher, agronomist, "Highlights of Outfield Test Results"; Dr. Joseph Keogh, assistant agronomist, "New Soil Test Research Under Way"; Dr. D. A. Hinkle, head, agronomy department, "Corn Test Results"; Dr. G. A. Bradley, assistant horticulturist, "Vegetable Fertilization," and Dr. Glenn Hardy, assistant agronomist, "Fertilizer Placement."

Dr. M. S. Williams, chief agricultural economist, National Plant Food Institute, will be the principal speaker at the banquet the evening of Nov. 22. His topic will be "A Program on Fertilizer Industry Improvement."

Fairfield Develops Midget Aerosol

NEW YORK — Fairfield Chemical Division, Food Machinery & Chemical Corp., has developed a midget insecticide aerosol, which contains only two ounces of concentrated active ingredients. Yet, the firm says that it has the performance equivalent to that of a conventional 12-ounce bomb.

The firm said that the new product lasts as long as the larger bomb because of a metered valve, which permits the dispensation of only one-sixth the amount of insecticide required by the larger bomb for insect control.

Development of the aersol was made possible through the use of an improved Pyrenone formula, the company said.

Stauffer Appoints New Advertising Agency

NEW YORK — Stauffer Chemical Co. has appointed St. Georges & Keyes, Inc., New York and Chicago, to handle the advertising for the firm's agricultural chemicals division. The announcement was made by Dan J. Keating, vice president of Stauffer and general sales manager of the division.

Stauffer operates some 48 plants in the U.S. and maintains agricultural sales offices in Tampa, Fla.; Omaha, Neb.; Harvey, La.; Houston, Weslaco and Lubbock, Texas; North Little Rock, Ark.; San Francisco and Los Angeles, Cal.; and North Portland, Ore. The company also maintains research laboratories in Chauncey, N.Y. and in Richmond, Mountain View and Torrance, Cal.

Golf Official Calls For Expanded Turf Research Program

PULLMAN, WASH.—The need for an annual million-dollar turf research program in the U.S. was voiced here recently by an official of the U.S. Golf Assn. Bill Bengeyfield, Los Angeles, western director of the association, made this point in addressing the 11th annual regional turf conference.

Mr. Bengeyfield, in calling attention to turf research needs, said that 100-million dollars are spent each year for turf maintenance. At least one per cent of that amount should be spent for the study of major turf problems. But only a small fraction of that amount is being spent, he declared.

The hard use given many golf courses, he said, aggravates problems that are tough enough in their own right—problems of weed, disease and pest control, and of soil structure and fertilizer needs, he said.

Mr. Bengeyfield said that 10,000 rounds of golf a month are now played on many western courses. He pointed out that the number of golf courses has not increased in proportion to the population. In 1930 there was one golf course in the U.S. for every 47,000 persons. Today there is only one course for every 167,000 persons.

A progress report on Washington State College research on turf diseases in western Washington was given the group by Dr. C. J. Gould, plant pathologist at WSC's Western Washington Experiment Station.

Mr. Gould said surveys conducted in western Washington over the past three years show that pink snow mold (fusarium patch) causes 90% of the disease problem on golf greens. Fairy ring and red thread are the most important diseases found in lawns, cemeteries, parks and golf course fairways in western Washington.

Research in progress on control of pink snow mold on putting greens, he said, shows best treatment to date is the use of the fungicide, PMAS, at 2-week intervals. Recommended application rate is ¾ ounce of PMAS in 10 gallons of water for each 1,000 square feet of turf, he said.

Fairy ring can be eliminated by fumigating the turf with methyl bromide in the spring or fall, he said. Recommended rate is 2 lb. per 100 square feet. A tarpaulin or some other cover should be kept over the treated area for 48 hours. The turf should be reseeded within one to two weeks after the treatment. Best control to date for red thread, Dr. Gould said, is a good nitrogen fertilization program.

Carloading Forecast

WASHINGTON—The National Association of Shippers Advisory Boards has forecast 88,248 fertilizer carloadings during the last quarter of 1957. This would be a .5% drop from 88,700 carloadings in the corresponding period in 1956.

W. Aubrey Smith New Vice President Of Southwest Potash

CARLSBAD, N.M.—W. Aubrey Smith, general manager of Southwest Potash Corp. here, has been elected a vice president of the firm. In his new position, Mr. Smith will be in charge of technical developments for Southwest, which will include potash research, product improvement and new processes. He will also be in charge of design and construction.

Associated with the potash industry for 21 years in engineering and operational capacities in both underground and surface operations, Mr. Smith joined Southwest in October, 1949 and has served as general manager since December, 1955.

The company also promoted V. A. Zandon, formerly assistant general manager, to general manager. John Sowers was promoted from mine superintendent to general superintendent at the Southwest property.

Mr. Zandon is a metallurgical engineering graduate of the University of British Columbia who has held numerous research and operational posts in Canadian and U.S. mining operations. He joined Southwest Potash as mill superintendent in 1954.

Mr. Sowers started his career in Pennsylvania coal mining and came to Southwest Potash in March, 1952 as general mine foreman.

American Agricultural Chemical Makes Changes

NEW YORK—The American Agricultural Chemical Co. has announced a series of changes in its fertilizer sales department.

J. C. Sliger, manager at Cairo, Ohio, has been named manager of the Danville, Ill.-Seymour, Ind., sales operations. W. H. Masters, manager at Henderson, N.C., joins Danville-Seymour sales, and V. W. Huttemier, assistant manager at Fulton, Ill., has been named agronomist at Danville-Seymour.

R. P. Cagley, assistant manager, National Stock Yards, Ill., becomes manager at Cairo. He is succeeded as assistant manager at National Stock Yards by W. H. Phillips, who has been assistant manager at Cincinnati.

C. E. Lowder, salesman at Baltimore, has been named assistant manager, Washington C.H., Ohio. W. J. White has been promoted from assistant manager to manager at Henderson, N.C. W. F. Turner, salesman at Carteret, N.J., has been named assistant manager at Buffalo, N.Y., and H. A. Finch, salesman at Pensacola, Fla., becomes assistant manager at Savannah, Ga.

R. E. Lehmkuhl, formerly production superintendent at the National Stock Yards, Illinois fertilizer works, has become responsible for production at the Danville, Ill. and Seymour, Ind. plants. He will have headquarters at Danville.

R. T. Green, formerly assistant superintendent at the firm's Fulton, Illinois fertilizer plant, replaces Mr. Lehmkuhl at National Stock Yards.

Hercules Sales Show Nine Month Gain

WILMINGTON—Hercules Powder Co. has reported for the nine months ended Sept. 30, net income equal after payment of preferred dividends to $1.62 a share of common stock. Net income for the first nine months of 1956 was equal to $1.66 a share of common stock.

For the third quarter of 1957, net income was equal after payment of preferred dividends to 59¢ a share of common stock. This compares with net income in the third quarter of 1956 equal to 48¢ a share.

Net sales and operating revenues for the nine months' period were $187,988,540 compared with $177,544,464 for the corresponding 1956 period.

CHEMICAL CONTROLS

(Continued from page 1)

that in today's research laboratory if you want to ascertain what chemicals are in a sample mixture "perhaps a test tube is the last thing you would reach for. Instead, you would insert the sample in a machine, push a button and sit back and wait perhaps only a few minutes for the answer in terms of both ingredients and quantities." He noted that in large laboratories test tubes are being pushed aside in favor of more modern instruments and indicated that during the past decade sales of this type of instrument have increased 10-fold to about $125 million a year.

"Already these manufacturers are learning how to adapt their instruments for use on the production line to provide fast, continuous checks on the production stream itself. This means making corrections immediately, thus cutting waste and producing a greater percentage of uniform quality," he stated.

Asking the question if this were a dream as concerns the fertilizer works, he said, "perhaps, but not so impossible." He then concluded with the observation that "a generation ago, who was bold enough to predict the tremendous changes that have since occurred in fertilizer processing and labor management relationships? Friends in Formosa have referred to their employment of a Klett Summerson Photoelectric Colorimeter to determine nitrogen, phosphoric anhydride and potash as routine procedure. They were satisfied that the technique gave results with a high degree of accuracy." Dr. Sauchelli said he knows of "several laboratories in the fertilizer industry which regularly use the flame photometer to determine potash and the infrared spectrophotometer to test pesticides. We are headed in the right direction and shall get there, even if the pace is sometimes snail-like."

The growing importance of the chemical analyst as an economic factor in the current and future success of industry was stressed by other speakers on the program. Walter J. Murphy, editorial director of the American Chemical Society, Washington, saw modern chemists with modern methods and instruments increasing their importance on the economic scene, indicating that "today they must be specialists in a dozen or more fields."

He saw the chemist giving the fertilizer industry a better quality program "if management lets the analytic chemist work for it." He then asked the question of whether management was cognizant of the value of the chemist and his importance on "the team." Industry and government must support certain projects of the analytic chemist, he contended.

This speaker called on the chemist to demonstrate to management that the end of the year report on the red or black side of the ledger may be due to the work of the analytic chemist. This must be brought home to those handling the purse strings, he declared. He visualized a good future for the chemist in the next decade.

The importance of the analytic chemist as "an indispensable member of the fertilizer production team from here on out," was also voiced by M. D. Sanders, plant food division of Swift & Co., Chicago.

This speaker contended that the control chemist to be successful must like chemistry, keep up with current research and developments, be honest with himself, share ideas and knowledge in the "team" and aim for a profit operation.

Outlining the qualifications of a successful chemist he listed intellectual integrity, maintenance of continuous liaison between management and production, satisfaction that his operation is correct, keeping an up-to-date library on analytical work, assurance he be taken into confidence on future plans of the company wherein his knowledge can be beneficial and coordinated through his department by the work of the technical man in research and the technical man in production.

A resume of the results of the Florida Fertilizer Control Research Project, initiated in 1953, was presented by Robert P. Thornton, Thornton Laboratories, Tampa, Fla. The review of the project included findings of interest to fertilizer manufacturers and control officials, sampling tools used, procedures for drawing samples, handling samples in the field and procedures and methods of handling and analyzing samples in the laboratory.

In outlining the project from 1954 to 1957, Mr. Thornton noted that the large biases reported in 1954 and 1956 experiments have been reduced to within the limits of normally expected laboratory variations in analyses.

Pointing to the situation under the Florida Fertilizer Law, which provides broad authority to the state chemist and the technical committee, he indicated that "if Florida had not had such a set-up and if this research work had not been done, we would still be forced to use the official A.O.A.C. tube—we would still have been levying and paying many unjust penalties—but most important of all, manufacturers, control officials and customers would still be criticizing each other blindly."

Describing the technical phases of the project, Mr. Thornton stated they were directed at these points:

1. Taking truly and consistently representative samples of all fertilizer mixtures, regardless of their composition or tendency to segregate.

2. The maintenance of the integrity of the representative samples up to arrival at point of analysis.

3. A state of fineness at that point which would insure the analyst being able to weigh various analysis portions of exactly the same composition.

4. Selection of methods of analysis and maintaining uniform procedures under these methods which would insure the best accuracy and uniformity of analytical results obtainable.

In the presentation Mr. Thornton noted that "we still have no known method or tool for drawing accurate representative samples of bulk fertilizer from truck or car."

The morning session concluded with an up-to-date review of the collaborative study on triple superphosphate presented by H. L. Marshall, Olin Mathieson Chemical Corp., Baltimore, representing the NPFI chemical control committee.

The report was an enlargement on the findings presented at the fertilizer industry round-table discussion last year, and pointed to the necessity of further collaborative study.

The presentation sparked a lively discussion period wherein it was recommended that the spectrophotometric method be employed. A show of hands indicated that 15 laboratories represented at the meeting had the equipment available and a collaborative study using this method is planned.

It was also noted that the same laboratories continued high or low in successive tests, indicating need for individual analyses for biases in the laboratories and cooperation on distributing findings.

Following a luncheon session, the conference concluded with a series of brief presentations with emphasis on discussion periods relative to the subjects outlined.

The short presentations covered "The Magruder Sample Work," by Sam F. Thornton, F. S. Royster Guano Co., Norfolk, Va.; "Need for Standard Samples of Potash and Nitrogen," by Carroll H. Perrin, Canada Packers, Ltd., Toronto, and "Some Comments on Triple Superphosphate Analysis," by J. R. Archer, International Minerals & Chemical Corp., East Point, Ga.

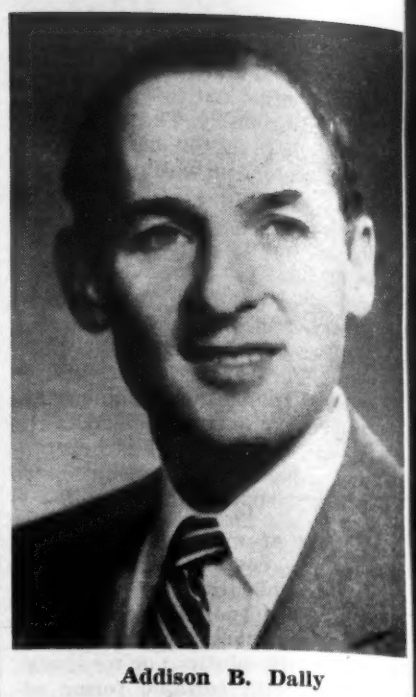
The final speakers on the afternoon program covered "A Rapid Method for Determining Urea in Ammonia Solutions," by J. A. Smith, Sohio Chemical Co., Lima, Ohio; a "Review of Nitrate-Chloride and Tetraphenyl Boron Methods," by E. D. Schall, Indiana state chemist office, Lafayette, Ind., and "The Relationship of the Chemical Control Office and the Local Fertilizer Industry," presented by A. S. Carter, director of the seed control and state chemist services, Purdue University, Lafayette, Ind.

Mr. Carter urged the fertilizer manufacturers to be careful in the selection of employees contacting the farmer, suggesting those "with a flair for public relations." He also counselled them not to change labels often as the farmer's reaction might be a tendency towards lack of confidence.

This speaker also counselled the manufacturer to tell the farmer to contact his state control office when a label is challenged, and have an official sample drawn rather than drawing and sending one himself.

Dr. Sauchelli announced that the brief remarks of the speakers would be developed into finished papers and published in booklet form outlining complete proceedings of the chemical control conference.

Following the conference, the National Plant Food Institute sponsored a reception, honoring the members of the Association of American Fertilizer Control Officials.



Addison B. Dally

SALES HEAD—Addison B. Dally has been named sales manager of the LP-gas and anhydrous ammonia equipment divisions of the RegO Division of the Bastian-Blessing Co., Chicago. He has been with the firm since 1948 and has been assistant sales manager since 1950.

Made Sales Engineer Of Nebraska Firm

BEATRICE, NEB.—George Siercks has been named to the post of sales engineer for Tote System, Inc., of Beatrice, manufacturer of bulk material handling equipment. Mr. Siercks will be assigned a territory in the near future, probably in the southeastern United States. Mr. Siercks is a graduate of Midland College, Fremont, Neb.

The firm manufactures shipping containers, storage containers, and self-discharge hoppers for large amounts of bulk material.

PESTICIDE CONTROL OFFICIALS

(Continued from page 1)

hoped that a complete new edition combining all information in the supplements will be issued eaarly in 1958.

The committee for toxicity and antidotes announced plans in preparation for Revision 2 to the Miller Act. The group is working toward a possible revision by 1959. The methods clearing house committee listed nine new methods of determination of ingredients in pesticides: including phosphorus, gamma isomer, parathion, rotenone, DDD or DDT, dieldrin, sodium salt or warfarin, and Pivalyn.

The question of dating or coding unstable pesticides at the time they are packaged was covered by the liaison committee. Such a bill, they said, was introduced in the Minnesota legislature this year. It passed the House, but was not acted upon by the Senate before adjournment. The check sample committee urged more positive industry-states collaboration in otaining check samples and recommended the committee gain broader cooperation from various national firms to submit samples.

Because there have been further instances of shipments of treated feed or food products encountered by control officials, the coloring of treated seeds continues to be a desirable step in control legislation, according to the committee in charge of this project. They recommended the proposed regulation be considered and adopted as far as practicable by control officials. The legislation committee reported that 27 of the states queried were in agreement that the sales and distribution of treated seed be regulated, but most believed the action is not within the intent of pesticide regulatory status.

The legislation committee further reported changes in state regulations during the past year, including California, Iowa, Maryland, Minnesota, Texas and Canada. In California, jurisdiction over chicken and livestock feeds containing a vermacide is separated from the law pertaining to pesticides. Iowa passed a new fertilizer law permitting mixtures of fertilizers and pesticides. The Uniform Law was adopted in Maryland and changes in registration fees were made in Minnesota and Pennsylvania. Texas amended a law to require registration of household products, while Canada exempts feed-pesticide mixes which are registered under its Feeding Stuffs Act.

The registrations committee reported that 28 of 43 states and Puerto Rico responding to a questionnaire were using uniform registration forms. Five states were not using the uniform form and four indicated no registration was required by law.

The committee on pesticide-fertilizer mixtures indicated changes in state regulations allowing the inclusion of new pesticides in these mixtures. These changes occurred in Indiana where aldrin, dieldrin and heptachlor were added; Louisiana where aldrin, chlordane, dieldrin and heptachlor were added; Michigan where dieldrin and heptachlor were added; Nevada where registration now is required under both the fertilizer and pesticide laws; Tennessee where a new regulation prescribes required labeling, and restricts such mixtures to pesticides meeting requirements of the Miller Amendment, and Virginia where aldrin and heptachlor now are accepted for southern corn root

worm, seed corn maggot and wireworms attacking corn.

In his remarks which opened the convention Oct. 19, AAPCO president H. J. Fisher, chief chemist, Connecticut experiment station, New Haven, explained the provisions of the new Hazardous Substances Act which goes into effect in Connecticut next January. While the law does not cover poisoning of insects for economic reasons, he said, the provisions for labeling under the law are of interest because they apply to some products of the industry's associates. The public too frequently is ready to blame all cases of suspected or unexplained poisoning on pesticides, he added, hence, it is well that we know the provisions of related acts.

Specifically, the law provides for proper labeling of products for general household use that might be involved in possible human poisoning situations. It confers no authority on the Food and Drug Commission to forbid the sale of any product—no matter how dangerous it might be—provided it is labelled as the law requires. Hazardous ingredients must be listed on the label with a signal word and an affirmative statement of the principal hazard, followed by precautionary measures and instructions for first aid. Also, it requires the word "poison" for any substances which are defined as such and instructions for handling and storing.

Mr. Fisher pointed up the importance of the sessions sponsored in recent years by the Pesticide Regulation Section of USDA, and while such a meeting was not held this year it was hoped that they would be resumed next year. The president also referred to the published "Condensed Data on Pesticide Chemicals" and its importance to food control officials and poison control centers. A sixth edition is planned for 1958, he said.

The speaker also referred to the question of where control action with plant growth regulators should be placed. This problem has arisen from new interest in the gibberellins, and due to the fact that their standardization requires techniques widely divergent from that of fertilizer analysis, it is the opinion of the pesticide group the plant growth regulators "should be in the field of our association," Mr. Fisher said. He recommended a joint committee with the fertilizer control group work out an agreement for presentation in 1958.

Sales of nematocides will reach $15 million in the U.S. this year, A. J. Taylor, nematologist, plant industry station, Beltsville, Md., said. This represents sufficient materials for treatment of 600,000 acres of cropland, he added. Because of the relatively high cost of nematocides, these products are used primarily on higher-priced crops. Expansion of this field can be measured by the fact that barely $1 million of nematocides were used 10 years ago.

The speaker described the physical make-up of nematocides and the means by which they damage plants. Because maximum results can be obtained and also because there is possible plant damage from some of the compounds, application is most effective directly into the soil before the crop is planted, Mr. Taylor said. Residues do not remain for more than a few days, so the practice generally is to apply the material some two weeks ahead of planting. Nematocides with minimum toxic effect are applied satisfactorily to such crops as citrus, arbor and nursery stock, he added.

A growing phase of nematocide work is in the field of seed bed preparation, he added. Several products are now on the market for this type of treatment and other development projects are underway. The most important fact to us is that in the whole field of nematology the expansion possibilities seem unlimited, he concluded.

Development of new fungicides and appraisal of their practical performance may be determined by laboratory assay and by field performance, Dr. James G. Horsfall, Connecticut Agricultural Experiment Station, New Haven, said in a discussion, "Bioassay of Fungicides."

"A successful foliage protectant," Dr. Horsfall said, "should meet three basic specifications: (1) killing power; it must be able to kill fungi, preferably a wide spectrum of fungi, (2) "hiding" power; it must be able to cover the foliage, stems and fruits to be protected, (3) staying power; it must stay on the foliage and not be lost to a multiplicity of subtractive influences. These specifications are amenable to laboratory assay."

Two types of assay are used for determining killing power: inhibiting spore germination or inhibiting hyphal growth. Hiding power, he said, comprises three phases, (1) How does the material arrive on the leaf or fruit? (2) After it arrives does it cover enough of the foliage to hide it well enough from the invading spores? (3) Does it remain on the leaf after the spray water runs off? The first question deals mainly with application equipment, and it also is important that the fungicidal particles be small for maximum killing power.

Coverage may be assayed by the slope of the dosage-response curve or by various physical measurements, the speaker indicated. Staying power is the real test of successful fungicidal protection. Resistance to water erosion is perhaps the easiest to assay because excellent methods have been devised. Also, the compound must not break loose and blow away, must not "boil" away in heat or simply fade away.

Field performance also is a tool for determining the value of fungicides. These determinations probably should be used to measure field performance: (1) The compound must inhibit the spores of one, preferably two or more, test organisms. (2) The slopes of the loss curves for rain, heat, hydrolysis and sunlight must be obtained. (3) Potential redistribution is needed.

"Much scientific research stems from faith," Dr. Horsfall concluded. "We think laboratory assay already has shown the feasibility of predicting much of field performance, and we have faith that techniques will yet be devised to improve and polish the ability to forecast."

The five-point program of the Labels and Precautionary Information Committee, Manufacturing Chemists Assn., was outlined by James D. Kittelton, LAPI secretary, Washington, D.C. These include (1) widespread dissemination of Manual L-1, "Warning Labels," and MCA chemical safety data sheets, (2) cooperation with other groups interested in precautionary labeling, (3) encouragement of uniform precautionary labeling legislation, (4) expansion of MCA labeling educational program and (5) fostering "Read the Label" activities.

"We feel that most widely used chemical products today carry adequate warning labels," Mr. Kittelton said. "The MCA always cooperates with government authorities and others when they find it necessary to prepare precautionary labeling legislation. Currently, California, Connecticut, Illinois, Oregon, New Jersey, Texas, New York and Hawaii have laws which follow our uniform principles of precautionary labeling.

"Today, both as a voluntary matter and as a matter of law, uniform precautionary labeling principles are in effect and observed by chemical manufacturers. We realize that it is only through cooperation with government groups and associations the chemical industry is able to maintain this uniformity."

Three bills are now pending before Congress, which would require the labeling of hazardous substances in retail packages, he said. It may be that if a Federal bill is passed, the states will follow suit and pass similar bills. And through our five-point informational program we hope to see that uniformity in precautionary labeling is maintained, he concluded.

OFFICERS NAMED

WASHINGTON—F. H. Gates, Denver, Colo., was elected president of the Association of American Pesticide Control Officials at the 11th annual meeting at the Shoreham Hotel here Oct. 19. He succeeds Harry J. Fisher, New Haven, Conn., who will continue for a year as a member of the AAPCO executive committee.

New vice president of the association is W. C. Geagley, Lansing, Mich., and A. B. Heagy, College Park, Md., continues as secretary-treasurer for another year. R. A. Moncrief of Georgia succeeds Clyde A. Bower, Oklahoma City, Okla., on the executive committee. Hold-over members of this committee include J. T. Coyne, pesticide regulatory section, USDA, Washington; E. R. Winterle, Tallahassee, Fla. and C. H. Jefferson, Ottawa, Canada.

Specialist Cites Fall Fertilization Advantages

STATE COLLEGE, S.D.—Farmers can save time and they could increase the response on certian crops next year if they apply fertilizer in the fall rather than wait until spring, according to Lloyd Davis, extension soils specialist at South Dakota State College. Fall application is just as profitable and in some cases may be more effective than spring applications. "This is particularly true when using phosphorus on legume crops," Mr. Davis said.

He said that fertilizer for small grain and corn can either be broadcast on the surface and plowed under in the fall or it can be spread on the surface now and disced in. "It should not be left exposed if the field is subject to wind or water erosion," he said. Grass and legume crops can easily be fertilized in this manner and fertilizer can be left on the surface.

AIDS RAILROADS

(Continued from page 1)

ing costs by "(a) pursuing a more vigorous policy toward the abandonment of unprofitable passenger train services; (b) the substitution of trucking in lieu of rail services where operating economies may be achieved; and (c) the consolidation, where feasible, of duplicate services."

The text of the resolution follows.

WHEREAS this is the first meeting of the Traffic Committee of the National Plant Food Institute since the Interstate Commerce Commission announced its decision in Ex Parte 206; and

WHEREAS there has been a steady increase in recent years in freight rates paid by fertilizer manufacturers; and

WHEREAS fertilizer tonnage has been and is continuing to be diverted in ever increasing amounts from the railroads to competing forms of transportation including private carriers; and

WHEREAS the fertilizer industry, acutely aware of its own problems, also knows that the railroads have similar problems arising from increasing costs; and

WHEREAS the Traffic Committee of the National Plant Food Institute believes that all possibilities of avoiding further rate increases must be exhaustively explored,

NOW THEREFORE BE IT RESOLVED that the National Plant Food Institute, acting through its Traffic Committee, offers such assistance as it may appropriately give before regulatory commissions or otherwise, in helping the railroads to reduce unit operating costs by: (a) pursuing a more vigorous policy towards the abandonment of unprofitable passenger train services; (b) the substitution of trucking in lieu of rail services where operating economies may be achieved; and (c) the consolidation, where feasible, of duplicate services.

NOW THEREFORE BE IT FURTHER RESOLVED that the southern carriers are hereby commended for their realistic forbearance in the application of rate increases permitted by the commission in Ex Parte 206.

AND BE IT FURTHER RESOLVED that railroad managements in other territories be urged to consider the application, on a realistic basis, of rate increases permitted in Ex Parte 206 in an effort to curb further diversion of fertilizer traffic from the railroads.

TRAFFIC GROUP—Members of National Plant Food Institute Traffic Committee are shown above during their recent meeting in Carlsbad, N.M. Seated, from left to right, are J. L. Tompkins, Virginia-Carolina Chemical Corp.; R. O. Erickson, the Anaconda Co.; Turner W. Blagg, U.S. Industrial Chemicals Co.; John S. Carlson, Stauffer Chemical Co.; Eugene Landis, International Minerals & Chemical Corp.; Paul T. Truitt, executive vice president, National Plant Food Institute; Walter D. Matson, of NPFI general counsel, Cummings, Sellers, Reeves and Conner; Philip Janicola, United States Potash Company; and John H. Wright, Ashcraft-Wilkinson Co. Standing are Norman F. Cheney, American Potash & Chemical Corp.; Lee Culbreth, Commercial Solvents Corp.; Bill Adams, Shell Chemical Corp.; Durward L. Brooks, Escambia Chemical Corp.; Blair Love, Consolidated Mining & Smelting Co. of Canada, Ltd.; Ellwood B. Luke, Western Phosphates, Inc.; Ronnie Ellwing, International Minerals & Chemical Corp.; Vernon Hansen, Southern States Cooperative; Howard McGalin, Olin Mathieson Chemical Corp.; I. C. Dickerson, Phillips Petroleum Co.; W. E. Maley, U.S. Borax & Chemical Corp.; Wilton Barger, Spencer Chemical Co.; Lloyd Robinson, International Minerals & Chemical Corp.; Zachary Taylor, Potash Company of America; Jack McBride, National Potash Co.; and Ralph Littrell, National Potash Co.

Croplife®

A WEEKLY NEWSPAPER FOR THE FARM CHEMICAL INDUSTRY

The regional circulation of this issue is concentrated in the Northeastern states.

"Telling 'Em—Selling 'Em" Works for Pesticides

One of the most effective methods used by anti-chemical zealots in their efforts to undermine the use of pesticides and inorganic plant foods is through appearing before various garden organizations and other groups. Talks made under such circumstances enable the speaker to get his points across without fear of much contradiction, and the listeners, frequently women, are often convinced that many human ills must be caused by "dousing our food with poisonous chemicals."

It is refreshing, therefore, to learn that some of these same methods of giving out information are also being used by people in the pesticide business to counteract some of the adverse publicity which has been handed out so generously of late.

The National Agricultural Chemicals Assn. is encouraging its members to study their local situations and determine whether leaders of civic and professional clubs know the pesticide story well enough to assure wives, associates, and employees that these chemical products contribute greatly to the community welfare. There is an opportunity on this level to get across the message that not only do pesticides contribute to the general welfare, but also there is nothing to fear from the proper use of these products.

As a case in point, R. C. Harnden, vice president of the agricultural chemicals division of Chapman Chemical Co., made a talk recently before the Rotary Club of Memphis, Tenn. The points he made, in addressing this group of business and professional men, could well be adapted by other leaders in the pesticide and fertilizer industries in bringing a similar message to like groups.

His talk was not a complicated one, but the main points of contention were covered. He pointed out that: 1. Pesticides contribute to the economic well-being of the community. 2. They enable farmers to raise the abundance of safe foods we need today. 3. They are safe for users and consumers because of the extensive research by industry before they are marketed and because of legislative controls of their use on food products.

He also stimulated audience interest by pointing out examples of how the use of pesticides benefits the businesses and careers of some of the members of the group to which he was talking. Present were cotton growers, livestock raisers, and a varied assortment of business men from the community, all of whom no doubt went away from the meeting with the feeling of a personal stake in better control of agricultural pests.

In conclusion, after having outlined many specific aspects of pesticides and their local economic value to the community as well as to the nation at large, Mr. Harnden said that the work done by the U.S. Department of Agriculture and the Food and Drug Administration has only two objectives: To get the economic value of a product determined and to protect the consumer. "We value life and health more than any other nation," he said. "We have been the leaders of the world in protecting our food supply from natural enemies, and in protecting the public. In this talk, I have tried to show you that our standard of living is not just dependent on, but based on, an abundant and healthful food supply. I've also tried to show how necessary it is that farmers use chemicals as weed killers, disease killers, insect killers and for other purposes so as to assure us of this food supply. And, I've further tried to show how our laws guarantee that the use of chemicals will not result in harmful chemical residues being on or in the food we eat.

"Now that we have looked into this little known business, I hope we see that it is truly our benefactor and that when we are eating, we need worry about nothing more serious than 'How many calories am I getting?'", he concluded.

We think that such an approach to the problem of education of the public is both sound and effective.

Hard-to-Kill Insects Worry Public Health Men

Could the increase in numbers of hard-to-kill insects have a significant effect on public health problems as well as those involved in agricultural pest control? This is a question considered at some length at the recent World Health Organization conference in Switzerland, and we think that the overtones have some interest to the American pesticide trade.

While the assembly did not particularly view the situation with alarm, it did note that "it would be irresponsible to dismiss the real possibility of a significant increase in the incidence of insect-borne diseases in man." In other words, the conference considered it has a responsibility in urging that something be done.

The conference, meeting under the chairmanship of K. D. Quarterman, of the U.S. Public Health Service, issued an urgent appeal to governments, scientists, and industry to intensify research into the global problem of insect resistance.

The conference drew up a research program into more than 40 aspects of the puzzling and complex phenomenon of resistance to insecticides.

The 11 members of the conference, among them directors of principal research laboratories in Asia, North and South America, Africa, and Europe, agreed to collaborate in this program. They recommended that WHO take the lead in stimulating and coordinating this international undertaking.

It was pointed out that in 1946 only two species of insects of public importance—the housefly and certain kinds of mosquitoes—were resistant to DDT, but today they number 38, among them several species of malaria-transmitting mosquitoes, plague-carrying fleas, and typhus-bearing lice.

Better Sales Seen in Tobacco-Growing Areas

A decided increase in the volume of vegetable crops grown in the south is in the offing, according to Robert H. Powell, president of the Powell Manufacturing Co., Wilson, N.C., in a recent talk before the Farm Equipment Institute. He arrived at this conclusion, he said, because farming in that area is becoming more diversified due to a drop in income from other crops.

In his talk, previewing the business outlook for the south, he predicted that "business in 1958 will be on a par with 1957, and may possibly show a slight increase now that growers have adjusted themselves to the production of quality tobaccos only."

Elaborating on this, he pointed out that tobacco, one of the chief "money crops" on which growers depend, has been bringing in less and less income due to the production of great quantities of undesirable leaves. "These varieties, while producing considerably more weight per acre and though much more disease resistant, proved to be less flavorful for the production of cigarettes and other tobacco products," he said.

Consequently, the 1957 crop will show an estimated 35% decrease in poundage, but because of the lack of undesirable varieties this year, there may be a substantial increase in prices paid to the farmer, he said.

All of these factors influence the planting of more vegetables, and thus will continue to affect the sales of both fertilizers and pesticides in the area.

Croplife's Home Office

Croplife

BPA — *Member of Business Publications Audit*

NBP — *Member of National Business Publications*

CROPLIFE is a controlled circulation journal published weekly. Weekly distribution of each issue is made to the fertilizer manufacturers, pesticide formulators and basic chemical manufacturers. In addition, the dealer-distributor-farm adviser segment of the agricultural chemical industry is covered on a regional (crop-area) basis with a mailing schedule which covers consecutively, one each week, four geographic regions (Northeast, South, Midwest and West) of the U.S. with one of four regional dealer issues. To those not eligible for this controlled distribution Croplife subscription rate is $5 for one year ($8 a year outside the U.S.). Single copy price, 25¢.

LAWRENCE A. LONG
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DONALD NETH
Managing Editor

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Dec. 2-3—Plant Food Producers of Eastern Canada, Seaway Hotel, Toronto, Canada.

Dec. 19-20—Missouri Soil Fertility Short Course, University of Missouri, Columbia, Mo.

1958

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Oct. 31—19th annual meeting, Middle West Soil Improvement Committee, Sherman Hotel, Chicago. Z. H. Beers, 228 N. LaSalle St., Chicago, executive secretary.

Oct. 31-Nov. 1—Second Annual Southern Fertilizer Conference and Second Annual Southern Soil Fertility Conference, Dinkler Plaza Hotel, Atlanta, Ga.

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Nov. 6-8—Fertilizer Industry Round Table, Sheraton Park Hotel, Washington, D.C.

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Nov. 14-15 — Sixth Annual Oregon Weed Conference, Withycombe Hall, Oregon State College, Corvallis, Ore., Rex Warren, Corvallis, Ore., Secretary.

Nov. 17-19—National Fertilizer Solutions Assn., Annual Convention, Netherland-Hilton Hotel, Cincinnati, Muriel F. Collie, 2217 Tribune Tower, Chicago 11, Ill.

Nov. 18-20—Carolinas-Virginia Pesticide Formulators Assn., Carolina Hotel, Pinehurst, N.C. W. R. Peele, 516 S. Salisbury, Raleigh, N.C., secretary.

Nov. 18-22—International Conference on Citrus Virus Diseases, University of California, Riverside Campus.

Nov. 18-22—American Society of Agronomy, Annual Meeting, Atlanta Biltmore Hotel, Atlanta, Ga.

Nov. 20—Annual Rutgers Pesticide Conference, University Commons, New Brunswick, N.J.

Nov. 20-21—Ohio Pesticide Institute, Annual Winter Meeting, Neil House, Columbus, Ohio, J. D. Wilson, Ohio Agricultural Experiment Station, Wooster, Ohio, Secretary.

Nov. 21—New Jersey Entomological Society, Fall Meeting, New Brunswick, N.J.

Nov. 21-22—Seventh Annual Arkansas Fertilizer School, Marion Hotel, Little Rock, Ark.

Nov. 25—Oklahoma Fertilizer Dealers Conference, Oklahoma State University, Stillwater, Okla.

Nov. 25-26—Entomological Society of America, Eastern Branch Meeting, Commodore Hotel, New York, B. F. Driggers, New Jersey Agricultural Experiment Station, New Brunswick, N.J., Branch Secretary.

Nov. 26—Oklahoma Soils and Crops Conference, Oklahoma State University, Stillwater, Okla.

Nov. 26 — Manufacturing Chemists Assn., 7th Semi-Annual Meeting and Winter Conference, Hotel Statler, New York.

Dec. 1-3—Southern Seedsmen's Assn., Jung Hotel, New Orleans.

Dec. 2-5—Entomological Society of America, 5th Annual Meeting, Hotel Peabody, Memphis, Tenn., R. H. Nelson, 1530 P St., N.W., Washington 5, D.C., Executive Secretary.

Dec. 2-5—Cotton States Branch, Entomological Society of America, 32nd Annual Meeting, Hotel Peabody, Memphis, Tenn., M. E. Merkl, Box 202, Leland, Miss., Secretary-Treasurer.

Dec. 2-6—Exposition of Chemical Industries, New York Coliseum.

Dec. 3-4—Iowa State College Fertilizer Manufacturer's Conference and Fertilizer Dealers' Short Course, Memorial Union, Iowa State College campus, Ames, Ia.

Dec. 4-5—Twelfth Annual Hybrid Corn Industry-Research Conference, La Salle Hotel, Chicago, Ill.

Dec. 4-6—Soil Science Society of Florida, Annual Meeting, Fertilizer Symposium on Dec. 5, University of Florida, Gainesville.

Dec. 5—Second Annual New Mexico Irrigation Exposition, Eastern New Mexico Fairgrounds, Roswell, N.M.; Al W. Woodburn and William Harr, c/o Southwest Public Service Co., Roswell, co-chairmen.

Dec. 6—Eighth Annual Fertilizer Dealers Short Course, South Dakota State College, Brookings, S.D.

Dec. 8-12—Vegetable Growers Association of America convention, Jung Hotel, New Orleans, La.

Dec. 9—Soils and Fertilizer Short Course, St. Paul Campus, University of Minnesota.

Dec. 9-12—Chemical Specialties Manufacturers Assn., Hollywood Beach Hotel, Hollywood, Fla.

Dec. 10-12 — North Central Weed Control Conference, 14th Annual Meeting, Hotel Savory, Des Moines, Iowa. Lyle A. Derscheid, agronomy department, South Dakota State College, Brookings, Program Chairman.

Dec. 11-13 — Agricultural Ammonia Institute, Seventh Annual Meeting, Hotel Marion, Little Rock, Ark., Jack F. Criswell, Claridge Hotel, Memphis, Executive Vice President.

Dec. 12-13—Beltwide Cotton Production Conference, Hotel Peabody, Memphis, Tenn.

1958

Jan. 7-8—Texas Fertilizer Conference, Texas A&M, College Station, Texas.

Jan. 8-10—Northeastern Weed Control Conference, Hotel New Yorker, New York, R. J. Aldrich, Rutgers University, New Brunswick, N.J., Secretary.

Jan. 13-15, 1958—Weed Society of America and Southern Weed Conference, joint meeting, Peabody Hotel, Memphis, Tenn.

Jan. 14-15—Georgia Plant Food Educational Society, Annual Meeting, University of Georgia, Athens, Ga., Fielding Reed, 710 Mortgage Guarantee Bldg., Atlanta, Ga., Secretary-Treasurer.

Jan. 14-16—Nebraska Fertilizer, Machinery and Chemical Exposition, Sponsored by the Nebraska Fertilizer Institute with the Nebraska College of Agriculture, Pershing Auditorium, Lincoln, Neb.

Jan. 20-21—Pest-O-Rama, sponsored by the Alabama Association for Control of Economic Pests, Coliseum, Montgomery, Ala., W. G. Eden, P.O. Box 626, Montgomery, Ala., Secretary-Treasurer.

Jan. 21-22—North Carolina Pesticide School, College Union Bldg., North Carolina State College, Raleigh.

Jan. 21-23—California Weed Conference, San Jose, Cal.

Feb. 4-6—North Carolina Pest Control Operators' Short Course, College Union, Raleigh, N.C. Clyde F. Smith, Dept. of Entomology, N.C. State College, secretary.

Feb. 13-14—Agronomists-Industry Joint Meeting, Edgewater Beach Hotel, Chicago, sponsored by the Middle West Soil Improvement Committee, Z. H. Beers, 228 N. LaSalle St., Chicago 1, Ill., Executive Secretary.

Feb. 20-22—Nitrogen Conference, University of Minnesota, St. Paul. M. W. Mawhinney, Smith-Douglass Co., Albert Lea, Minn., Chairman.

March 4-5—Western Cotton Production Conference, Hotel Cortez, El Paso, Texas, Conference Sponsored by the National Cotton Council and the Five State Cotton Growers Assn.

June 15-18—National Plant Food Institute, Annual Meeting, Greenbrier Hotel, White Sulphur Springs, W. Va.

June 25-27—Pacific Branch, Entomological Society of America, San Diego, Cal.

July 18-19—Southwest Fertilizer Conference and Grade Hearing, Buccaneer Hotel, Galveston, Texas.

Texas Gulf Sulphur Elects Vice Presidents

NEW YORK—Election of three new vice presidents has been announced by the board of directors of Texas Gulf Sulphur Co.

The new vice presidents are Dr. C. F. Fogarty, head of the company's geological department; Edward C. Meagher, treasurer, and Emile F. VanderStucken, Jr., secretary.

Dr. Fogarty, whose department is located in the company's Houston, Texas, office, joined Texas Gulf Sulphur in 1952. Mr. Meagher, who joined the company in 1921, has spent his entire business career with Texas Gulf Sulphur. Mr. VanderStucken had his own law practice before becoming associated with the company in 1925. Mr. Meagher and Mr. VanderStucken are in the corporation's New York office.

Classified Ads

Classified advertisements accepted until Tuesday each week for the issue of the following Monday.

Rates: 15¢ per word; minimum charge $2.25. Situations wanted, 10¢ a word; $1.50 minimum. Count six words of signature, whether for direct reply or keyed care this office. If advertisement is keyed, care of this office, 20¢ per insertion additional charged for forwarding replies. Commercial advertising not accepted in classified advertising department. Advertisements of new machinery, products and services accepted for insertion at minimum rate of $10 per column inch.

All Want Ads cash with order.

HELP WANTED

WANTED—MANAGER FOR FERTILIZER and weed spraying business. Must have knowledge of fertilizers and chemicals. Reliable and steady. Write or call, Henry J. Alke, Wood Lake, Minn.

SITUATIONS WANTED

EXPERIENCED BUYER—SALES MANAGer specialty fertilizers, lawn seed, insecticides. 7½ years with fertilizer manufacturer. 8 years distributor sales manager. Technical knowledge Turf-Do Sales Promotion, advertising, introducing new products to market. Address Ad No. 3154, Croplife 1, Minn.

BUSINESS OPPORTUNITIES

FOR SALE — FERTILIZER EQUIPMENT and tornado-damaged fertilizer plant at Fargo, N. D. Building has vertical columns, foundation, bin cribbing, warehouse dock. Equipment consists of drying, cooling and pelletizing drums, fans, dust collectors, Stedman mixer, I and C bagger, hopper system, and scales, flowrators, bucket elevators. Keystone 150 H.P. boiler, two Tyler screens, one Link Belt vibrating screen, two payloaders, Yale forklift and pallets. Acid and fuel oil tanks, several miscellaneous conveyors, 50 totally enclosed motors up to 40 H.P. Contact Ted B. Schultz, Assistant General Manager, Peavey Elevators, 809 Grain Exchange, Minneapolis 15, Minn.

MICHIGAN LIME USE

EAST LANSING, MICH.—Michigan farmers put about half a million tons of lime and marl on their fields this year, estimates Ed Longnecker, extension soils specialist at Michigan State University. This is about the same amount of liming materials that were used in the state for agricultural purposes last year.

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ov. 18-22—American Society of Agronomy, Annual Meeting, Atlanta Biltmore Hotel, Atlanta, Ga.

ov. 20—Annual Rutgers Pesticide Conference, University Commons, New Brunswick, N.J.

ov. 20-21—Ohio Pesticide Institute, Annual Winter Meeting, Neil House, Columbus, Ohio, J. D. Wilson, Ohio Agricultural Experiment Station, Wooster, Ohio, Secretary.

ov. 21—New Jersey Entomological Society, Fall Meeting, New Brunswick, N.J.

ov. 21-22—Seventh Annual Arkansas Fertilizer School, Marion Hotel, Little Rock, Ark.

ov. 25—Oklahoma Fertilizer Dealers Conference, Oklahoma State University, Stillwater, Okla.

Nov. 25-26—Entomological Society of America, Eastern Branch Meeting, Commodore Hotel, New York, B. F. Driggers, New Jersey Agricultural Experiment Station, New Brunswick, N.J., Branch Secretary.

Nov. 26—Oklahoma Soils and Crops Conference, Oklahoma State University, Stillwater, Okla.

Nov. 26 — Manufacturing Chemists Assn., 7th Semi-Annual Meeting and Winter Conference, Hotel Statler, New York.

Dec. 1-3—Southern Seedsmen's Assn., Jung Hotel, New Orleans.

Dec. 2-5—Entomological Society of America, 5th Annual Meeting, Hotel Peabody, Memphis, Tenn., R. H. Nelson, 1530 P St., N.W., Washington 5, D.C., Executive Secretary.

Dec. 2-5—Cotton States Branch, Entomological Society of America, 32nd Annual Meeting, Hotel Peabody, Memphis, Tenn., M. E. Merkl, Box 202, Leland, Miss., Secretary-Treasurer.

Dec. 2-6—Exposition of Chemical Industries, New York Coliseum.

Dec. 3-4—Iowa State College Fertilizer Manufacturer's Conference and Fertilizer Dealers' Short Course, Memorial Union, Iowa State College campus, Ames, Ia.

Dec. 4-5—Twelfth Annual Hybrid Corn Industry-Research Conference, La Salle Hotel, Chicago, Ill.

Dec. 4-6—Soil Science Society of Florida, Annual Meeting, Fertilizer Symposium on Dec. 5, University of Florida, Gainesville.

Dec. 5—Second Annual New Mexico Irrigation Exposition, Eastern New Mexico Fairgrounds, Roswell, N.M.; Al W. Woodburn and William Harr, c/o Southwest Public Service Co., Roswell, co-chairmen.

Dec. 6—Eighth Annual Fertilizer Dealers Short Course, South Dakota State College, Brookings, S.D.

Dec. 8-12—Vegetable Growers Association of America convention, Jung Hotel, New Orleans, La.

Dec. 9—Soils and Fertilizer Short Course, St. Paul Campus, University of Minnesota.

Dec. 9-12—Chemical Specialties Manufacturers Assn., Hollywood Beach Hotel, Hollywood, Fla.

Dec. 10-12 — North Central Weed Control Conference, 14th Annual Meeting, Hotel Savory, Des Moines, Iowa. Lyle A. Derscheid, agronomy department, South Dakota State College, Brookings, Program Chairman.

Dec. 11-13 — Agricultural Ammonia Institute, Seventh Annual Meeting, Hotel Marion, Little Rock, Ark., Jack F. Criswell, Claridge Hotel, Memphis, Executive Vice President.

Dec. 12-13—Beltwide Cotton Production Conference, Hotel Peabody, Memphis, Tenn.

1958

Jan. 7-8—Texas Fertilizer Conference, Texas A&M, College Station, Texas.

Jan. 8-10—Northeastern Weed Control Conference, Hotel New Yorker, New York, R. J. Aldrich, Rutgers University, New Brunswick, N.J., Secretary.

Jan. 13-15, 1958—Weed Society of America and Southern Weed Conference, joint meeting, Peabody Hotel, Memphis, Tenn.

Jan. 14-15—Georgia Plant Food Educational Society, Annual Meeting, University of Georgia, Athens, Ga., Fielding Reed, 710 Mortgage Guarantee Bldg., Atlanta, Ga., Secretary-Treasurer.

Jan. 14-16—Nebraska Fertilizer, Machinery and Chemical Exposition, Sponsored by the Nebraska Fertilizer Institute with the Nebraska College of Agriculture, Pershing Auditorium, Lincoln, Neb.

Jan. 20-21—Pest-O-Rama, sponsored by the Alabama Association for Control of Economic Pests, Coliseum, Montgomery, Ala., W. G. Eden, P.O. Box 626, Montgomery, Ala., Secretary-Treasurer.

Jan. 21-22—North Carolina Pesticide School, College Union Bldg., North Carolina State College, Raleigh.

Jan. 21-23—California Weed Conference, San Jose, Cal.

Feb. 4-6—North Carolina Pest Control Operators' Short Course, College Union, Raleigh, N.C. Clyde F. Smith, Dept. of Entomology, N.C. State College, secretary.

Feb. 13-14—Agronomists-Industry Joint Meeting, Edgewater Beach Hotel, Chicago, sponsored by the Middle West Soil Improvement Committee, Z. H. Beers, 228 N. LaSalle St., Chicago 1, Ill., Executive Secretary.

Feb. 20-22—Nitrogen Conference, University of Minnesota, St. Paul. M. W. Mawhinney, Smith-Douglass Co., Albert Lea, Minn., Chairman.

March 4-5—Western Cotton Production Conference, Hotel Cortez, El Paso, Texas, Conference Sponsored by the National Cotton Council and the Five State Cotton Growers Assn.

June 15-18—National Plant Food Institute, Annual Meeting, Greenbrier Hotel, White Sulphur Springs, W. Va.

June 25-27—Pacific Branch, Entomological Society of America, San Diego, Cal.

July 18-19—Southwest Fertilizer Conference and Grade Hearing, Buccaneer Hotel, Galveston, Texas.

Texas Gulf Sulphur Elects Vice Presidents

NEW YORK—Election of three new vice presidents has been announced by the board of directors of Texas Gulf Sulphur Co.

The new vice presidents are Dr. C. F. Fogarty, head of the company's geological department; Edward C. Meagher, treasurer, and Emile F. VanderStucken, Jr., secretary.

Dr. Fogarty, whose department is located in the company's Houston, Texas, office, joined Texas Gulf Sulphur in 1952. Mr. Meagher, who joined the company in 1921, has spent his entire business career with Texas Gulf Sulphur. Mr. VanderStucken had his own law practice before becoming associated with the company in 1925. Mr. Meagher and Mr. VanderStucken are in the corporation's New York office.

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Classified advertisements accepted until Tuesday each week for the issue of the following Monday.

Rates: 15¢ per word; minimum charge $2.25. Situations wanted, 10¢ a word; $1.50 minimum. Count six words of signature, whether for direct reply or keyed care this office. If advertisement is keyed, care of this office, 20¢ per insertion additional charged for forwarding replies. Commercial advertising not accepted in classified advertising department. Advertisements of new machinery, products and services accepted for insertion at minimum rate of $10 per column inch.

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MICHIGAN LIME USE

EAST LANSING, MICH.—Michigan farmers put about half a million tons of lime and marl on their fields this year, estimates Ed Longnecker, extension soils specialist at Michigan State University. This is about the same amount of liming materials that were used in the state for agricultural purposes last year.

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